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CARCINOMA OF THE CERVIX UTERI

A STATISTICAL SURVEY OF TWENTY-ONE YEARS OF TREATMENT

EUGENE S. AUER, M.D.

ST. LOUIS

This study is based on an analysis of the result of treatment of all cases of cancer of the cervix seen at the Barnard Free Skin and Cancer Hospital from 1906 through 1926, the first twenty-one years of its existence. During this time the gynecologic service was in charge of Drs. George Gellhorn and F. J. Taussig, who alternated every six months. The service, up to recent years, has consisted largely of far-advanced cases, owing to the fact that other hospitals have sent many patients to our free cancer wards. Comparisons of statistics from different institutions are of little value. More information is obtained by setting side by side the results of different methods of treatment at various times in the same place and under similar conditions. For this reason, an analysis of our material promises to be instructive.

This study is based on 634 patients suffering from carcinoma of the cervix, of whom 498 were treated while the remaining 136 received no treatment except medicine and general advice. The cases have been divided into two major groups: those treated from 1906 to 1916 inclusive and those treated from 1917 to 1926 inclusive. The reason for this division is the fact that radium was obtained in 1917 and brought about a radical change in the cancer therapy at our hospital.

A study of the figures, as will be seen later, discloses a lower five-year cure rate than is usually reported. A large factor is the geographic location of this clinic and the source of our material. A large fraction of our patients come from Arkansas, Missouri, Mississippi, southern Illinois, Kentucky and Tennessee. During the years of the study, the vital statistics in some of these states were incomplete so that we were not always able to follow up our patients after they had been discharged; and on general principle we count every patient whom we cannot locate as dead from cancer. In this respect we are less fortunate than workers in Eastern centers, where follow up is easier. A considerable number of patients from this area were unable to communicate with the clinic, owing to illiteracy.

As has previously been stated, 634 cases of primary cervical cancer were seen in the twenty-one years covered by this report, of which 498 were treated in the outpatient department and hospital. The total percentage of cure (table 1) is relative, as it is based only on the number of cases treated rather than those seen. One hundred and thirty-six patients did not receive any treatment either because they absented themselves or were in an altogether hopeless condition; others were referred back to their family physician or were not entitled to free service. After the introduction of radium in 1917, however, even the apparently hopeless cases were given the benefit of radiation.

Table 1 shows that cures of five years were obtained in but 9.64 per cent. This low percentage is in part explained in table 2, which shows the large number of patients (17.6 per cent) who could not be located. It must be repeated that all patients not accounted for were listed as having died of cancer.

Table 3 shows the age incidence of the patients coming to the clinic. During the early years of the study our records were relatively incomplete, thereby causing some discrepancy in the figures. It will be noted that almost a majority of the cases fall into the age group of 40 to 55, commonly known as the "cancer age." However, attention is called to the fact that 29.09 per cent of the patients seen were under the age of 40.

Table 4 demonstrates the cases treated year by year and the results obtained by the various methods of treatment. In addition, some idea of the permanence of the cures is obtained from the large number (thirty-five) alive at the end of 1931. Of the remaining thirteen patients, now dead but who remained free from cancer five years after treatment, only six died as a result of carcinoma.

We have classified the cases of both major categories into clinical groups according to the extent of the disease (table 5). This classification was determined solely by the physical examination. Group 1 comprises those cases in which involvement was limited to one half or less of the cervix. Group 2 comprises those cases in which more than half of the cervix was involved but in which there was no palpable vaginal or parametrial extension, although one or the other could occasionally be demonstrated microscopically. Group 3 comprises those cases in which the malignant process had invaded the vaginal wall without perforation and/or parametrial thickening to one pelvic wall. The other parametrium might be involved but was not infiltrated to the pelvic wall. Group 4 includes all cases in which there was total fixation of the uterus, due to parametrial infiltration, fistula or metastasis to distant organs, bones or glands.

An analysis of five-year cures for the first group of cases, 1906 to 1916 inclusive, during which time no radium was available for treatment, is seen in table 6. The methods of treatment during this period were excochleation, acetone locally, pancreatic treatment, copper treatment, and radical surgery. It is almost superfluous to state that the only cures established were

From the Gynecologic Service, Barnard Free Skin and Cancer Hospital.

by means of surgery. The proportion of cures (27.2 per cent in group 1 and 26.66 per cent in group 2) does not compare unfavorably with other figures reported for that period. The operability rate during this period was 17 per cent, although "inoperable" cases were occasionally subjected to operation but without success.

TABLE 1.—*Percentage of Cure in Cases Treated*

Total cases seen		634
Untreated		136
Treated, 1906 to 1916	147	
Treated, 1917 to 1926	351	
		498
		634
Total cures: 1906 to 1926		48, or 9.64%
1906 to 1916		7, or 4.76%
1917 to 1926		41, or 11.68%

TABLE 2.—*Patients Lost Before the End of the Five Year Period* *

Period	Number of Patients
1906 to 1916	46
1917 to 1926	42

* Some of these patients were lost as late as four years and six months after treatment, but all go into the statistics as having died of cancer when lost.

TABLE 3.—*Ages of Patients*

Age	Number of Patients	Per Cent
22 to 30	18	3.68
30 to 35	45	9.22
35 to 40	79	16.19
40 to 55	225	45.81
55 to 60	63	12.91
60 to 70	45	9.22
70 to 90	13	2.66

A similar analysis for the second group of cases, from 1917 to 1926 inclusive, is seen in table 7. In this series the operability rate was 15.6 per cent, compared with 17 per cent for the earlier series. This lowering of the operability rate was due, no doubt, to the sudden influx of far-advanced cases that were received during the latter portion of 1917 and during the entire year of 1918. The knowledge that radium had become available in the treatment of carcinoma in this clinic was responsible for many obviously incurable patients presenting themselves to us at this time. Referring back to table 4, it will be seen that in 1918 thirty new cases were treated with but one five-year cure. Such a figure is not duplicated anywhere in this series, the next lowest year being 1919, when the percentage of cure was 10 per cent, exactly three times that of 1918. In table 7, the proportion of five-year cures of group 1 is 54.17 per cent, treated by all methods, a figure that may well be called satisfactory. The results in the other three groups are also fairly satisfactory. Our poor salvage rate of but 3.20 per cent in group 4 cases can be explained by the extremely far-advanced condition that was found when these patients presented themselves to us.

A comparison of all cases treated by operation or with radium during the years 1917 to 1926 is seen in table 8. The surgical cures were accomplished solely by means of radical operations of the Wertheim or Schauta types with the exception of one patient, who remained well after a radical ignicauterization by the Byrne method. In groups 1 and 2 there can be noted a definite advantage of the results of surgery over radiation. In the remaining cases, radiation offered the only hope of a cure. Of thirty-one cases of all groups subjected to operation, 48.38 per cent remained well and free of cancer for at least five years. Three hundred and twelve patients were treated with radium; of these, only 8.33 per cent survived the five-year period, but of course there were among them a majority in the advanced stage of the disease.

TABLE 4.—*Cures by Years*

Year	Number of Cases Treated	Cures	Per Cent Cured	Living, January, 1932
1906	9	0	0	0
1907	4	0	0	0
1908	15	1	6.66	0
1909	9	1	11.11	0
1910	13	0	0	0
1911	14	0	0	0
1912	13	0	0	0
1913	9	0	0	0
1914	17	0	0	0
1915	25	2	8.00	1
1916	19	3	15.78	2
1917	13	2	15.38	1
1918	30	1	3.33	0
1919	30	3	10.00	2
1920	25	3	12.00	2
1921	39	4	10.25	3
1922	46	5	10.87	3
1923	50	8	16.00	6
1924	35	4	11.42	4
1925	49	7	14.28	7
1926	36	4	11.11	4
	498	48		35

During this second series of cases the following methods were used: (1) radical surgery; (2) radium therapy; (3) surgery preceded or followed by irradiation; (4) roentgen therapy.

TABLE 5.—*Clinical Classification of Patients*

Classification	1906–1916	1917–1926
Group 1	11	24
Group 2	15	31
Group 3	37	70
Group 4	82	187
Recurrence in stump or vagina	1	35
Unclassified	1	4
Total	147	351

TABLE 6.—*Analysis of Cures, 1906-1916 (No Radium Available)*

Clinical Classification	Number of Cases	Number of Cures	Per Cent of Cures (Absolute)	Number of Operations	Per cent Operative Cures
Group 1	11	3	27.2	10	30
Group 2	15	4	26.66	12	36.36
Group 3	37	0	0	9	0
Group 4	82	0	0	4	0
Stump of cervix	1	0	0	0	0
Unclassified	1	0	0	0	0
	147	7		35	

Seven cures of 35 operated cases = 20 per cent relative operative cures.

1. As previously stated, radical surgery was by the Wertheim or the Schauta type of operation.

2. Radium was not at first used in a standardized method. The radium element (150 mg.) was used in the form of bare needles, and also with screening of rubber, lead, brass and/or dental wax. It was used in

varying dosages; as low as 2,200 milligram hours and as high as 8,000 milligram hours were used in an attempt to effect a cure. Radon also was used during this time with varying success. It was not until the end of the period of this paper that a definite method of radium therapy came into use.

TABLE 7.—*Five Year Cures, All Treatments, 1917-1926*

Clinical Classification	Number of Cases	Number of Cures	Per Cent of Cures (Absolute)
Group 1.....	24	13	54.17
Group 2.....	31	10	32.25
Group 3.....	70	9	12.85
Group 4.....	187	6	3.20
Stump of cervix.....	35	3	8.57
Unclassified	4	0	0
	351	41	

3. Radium and radical surgery were used in a few cases in combination. When a cure or failure was encountered in the use of this combined form of treatment, the method which was deemed by careful examination to be the cause of success or failure was so credited. This was done on microscopic examination of the tissue removed before or at the time of the second treatment. For example, a patient having received a preliminary dose of radium was operated on at a later date. Microscopic examination of the cervix showed an active carcinoma. This patient remained well for five years, and the cure was listed as an operative one.

TABLE 8.—*Radium or Operative Cures, 1917-1926* *

Clinical Classification	Number of Operations	Number of Cures	Per Cent of Operative Cures	Number Irradiated	Number of Cures	Per Cent of Radium Cures
Group 1...	15	9	60.00	9	4	44.40
Group 2...	10	5	50.00	21	5	23.81
Group 3...	4	0	0	66	9	13.48
Group 4...	2 †	1 †	50.00	181	5	2.76
Stump of cervix.....	0	0	none treated	35	3	8.57
	31	15	48.38	312	26 =	8.33

Operated	31	Cures:	
Radiated	312	Operative..	15 out of 31 cases = 48.38%
	343	Radium....	26 out of 312 cases = 8.33%
No radium or operation (palliative-acetone, etc.).....	8		41 out of 343 cases = 11.96% of all cases treated with radium or operation.
	351		

* Operations were either Wertheim or Schauta or radical cauterization (Byrne).
† Cautery.

4. High voltage roentgen therapy as a supplement to other forms of treatment was used in a minority of the cases. Palliative results in the control of bleeding, discharge and pain were obtained. In the past five years more intensive and systematic roentgen therapy has been given as an auxiliary to radium therapy and to surgery.

Table 9 demonstrates the relation of age to cure. It is seen that the very young women, of whom there were eighteen below the age of 30, have indeed a poor prognosis, as our percentage of 5.55 would tend to show. Our greatest number of five-year cures are seen in the age groups of 30 to 35 and 55 to 60. Of the patients coming to us after the age of 70 there were no five-year cures.

The end-results of all radical operations for carcinoma of the cervix over the entire period of this survey are seen in table 10. The 20 per cent primary operative mortality seems rather high, but at the present time, with greater care in the selection of cases, better preoperative preparation and preliminary radium treatment, this has been greatly reduced. A total of sixty-six cases shows a five-year cure rate of 33 per cent. These figures include fourteen inoperable cases in which operation was performed prior to 1917. Were it possible to omit these cases from our figures, a much higher five-year cure rate would result with a slightly lower primary operative mortality. In compiling this

TABLE 9.—*Relation of Age to Cure*

Age	Cures	Cases	Per Cent of Cure
20 to 30.....	1	18	5.55
30 to 35.....	6	45	13.32
35 to 40.....	6	79	7.59
40 to 55.....	23	225	10.22
55 to 60.....	9	63	14.28
60 to 70.....	3	45	6.66
70 to 90.....	0	13	0
	48	488	
Ages unknown	..	10	
		498	

table it was noted that 75 + per cent of all patients treated with radium were dead within one year and 90 + per cent were dead within twenty-four months. A patient who has been treated with radium and who survives two years seems to have a very good chance of remaining free from recurrence for at least five years. This summary also demonstrates the low operability rate of all patients seen in this clinic. The absolute operability rate, including the 136 untreated cases, is 12.7 per cent; the relative figure computed only with respect to the number of treated patients is 16.27 per cent. These figures once more emphasize the unfavorable quality of the material that congregates in a cancer hospital.

A study of the cases revealed the fact that 96 per cent of all patients seen were multiparous. This figure is larger than one would expect in a similar group of women of the same age not having cancer and adds to the evidence that the irritation of the cervix due to pregnancy with subsequent dilatation of the cervix is one of the factors influencing the frequency of the neoplasm at this site.

Irradiation was repeated in twenty-three cases at periods varying from four months to two years after the completion of the primary therapeutic course.

TABLE 10.—*Radical Operations, 1906-1926*

	Number	Per Cent
Lost after leaving hospital.....	13	20
Died postoperatively	13	20
Alive 5 years or more.....	22	33
Alive 4 years.....	2	3
Alive 3 years.....	4	6
Alive 2 years.....	8	12
Alive less than 2 years.....	4	6
	66	100

Radium cases:
90+% dead within 24 months
75+% dead within 12 months
But 81 cases of 634 seen were classified as operative (groups 1 and 2), an operability rate of but 12.74%

Three of these patients survived the five-year period. This is practically double the rate obtained in those cases in which irradiation was not repeated (13.1 per cent compared to 7.7 per cent). In the past three years, increasing numbers of patients have been irradiated more than once with satisfactory results.

Material for the study of the index of malignancy as described by Broders was found available in the pathologic files in more than 300 cases from 1906 to 1926. The details of this histologic study will be published at a later date.

SUMMARY

1. This paper is based on 498 cases of primary carcinoma of the cervix treated from 1906 to 1926 at the Barnard Free Skin and Cancer Hospital.

2. The low percentage of cure may be in part ascribed to the geographic location of this clinic, with the resulting difficulties in the follow up of patients, and also by the large percentage of far-advanced cases presenting themselves for treatment.

3. Prior to the use of radium, but 4.76 per cent of the patients survived a five-year period. After the use of radium was begun, 11.67 per cent of the patients survived a five-year period.

4. The educational campaign instituted by the American Society for the Control of Cancer has definitely increased the number of patients applying to our hospital, but the percentage of early cases has not greatly increased (from 11 per cent to 16 per cent).

5. The repetition of irradiation is of considerable importance and should increase the survival rate. This feature is dependent on an efficient social service follow-up system to insure frequent systematic examinations to detect recurrences at the earliest possible time. This service can function efficiently, as is borne out by the fact that no case in this service has been lost in the past three years.

6. In certain cases a combination of surgery and irradiation would seem definitely indicated.

7. Radium and roentgen therapy offer the only hope of cure in cases of clinical group 3 and group 4 carcinoma of the cervix.

8. Radical surgery proved superior to radium therapy in establishing a cure in patients in whom the carcinoma was apparently confined to the cervix. In groups 1 and 2 of the period 1917-1926, 56 per cent of twenty-five operated on were cured, whereas only 30 per cent of the thirty irradiated remained well over five years. Furthermore, the operative results showed greater permanence after the five-year period than did the irradiated patients. For these reasons I believe that our results indicate that radical surgery still offers the greater hope of cure in early carcinoma of the cervix.

730 Missouri Building.

The Eosinophil and Basophil Cells in the Pituitary.—Evans and Simpson have been able to isolate from the eosinophil cells a hormone which is concerned with growth, and another from the basophil cells which is concerned with sexual development. Moreover, there is a definite antagonism between them, the growth hormone being capable of completely nullifying the other if both are simultaneously injected. That growth precedes sexual maturity is presumably due to the early predominance of the growth hormone. When the basophil cells are about to assert themselves over the eosinophil cells, puberty occurs. The association between the eosinophil cells and growth is indicated by the coincidence of eosinophilous adenomas with gigantism or hemihypertrophy, if they develop before the epiphyses join up, and with acromegaly if they develop subsequently. Gigantism is sometimes quite partial—as in one finger. Beware of removing such local gigantisms; the operation has been followed by a gigantic growth of the whole limb. This has an interesting bearing on Susman's recent hypothesis as to the influence of overactivity of the anterior lobe in the causation of malignant disease.—Brown, W. L.: Remarks on the Endocrines and Some Associated Psychoneuroses, *Brit. M. J.*, Feb. 6, 1932.

"ABORTIVE" POLIOMYELITIS

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To Wickman,[1] credit is usually and justly given for the first adequate description of so-called abortive poliomyelitis, although a few years previously reference had been made to the existence of variant forms of the disease.[2] It would seem, however, that present-day usage of the somewhat unfortunate term abortive poliomyelitis does not embrace all the manifestations of the disease that Wickman had in mind. He included four varieties of poliomyelitis of the abortive type: (1) cases running the course of a general infection; (2) cases in which signs of meningeal irritation were especially prominent ("pseudomeningism"); (3) cases accompanied by distinct tenderness ("pseudo-influenzal"), and (4) cases with disturbances of the gastro-intestinal tract. He believed that abortive cases, representing any or all of his four types, made up a considerable proportion of all the cases in any epidemic of poliomyelitis but that their exact ratio could not be determined.

The same general concept has been held by Draper,[3] who, in emphasizing the dual phases of clinical poliomyelitis, points out that in the first phase the cardinal symptoms may be those of a gastro-intestinal upset, tonsillitis or malaise, and that from 50 to 80 per cent of the total incidence of the disease may be limited to this phase. However, such nondescript symptoms as those which characterize the first phase do not present a clinical picture which may be readily identified, and perhaps this is the reason that many physicians seem unwilling to make a diagnosis of either poliomyelitis or abortive poliomyelitis in the absence of meningitic or myelitic involvement. In any event, the question of uncertainty of diagnosis has precluded the inclusion of such cases in statistics on poliomyelitis,[4] although it is needless to point out that, if the disease is thus limited, such a concept will enormously influence views not only on its epidemiology but also on its fundamental nature. Furthermore, although there are occasional early instances of the demonstration of specific protective bodies in the blood of patients who had sustained an attack of abortive poliomyelitis,[5] its status as a concrete entity has been somewhat shaken by a recent study by Kramer and Aycock.[6] Their results tend to show that a group of children who had passed through minor illnesses (probably comparable to Wickman's abortive types), which occurred coincidentally

From the Departments of Pediatrics and Medicine, Yale University School of Medicine.

1. Wickman, Ivan: Acute Poliomyelitis, Nervous and Mental Disease Monograph Series 16, New York, 1913. (Also previous papers.)

2. Caverly, C. S.: Notes of an Epidemic of Acute Anterior Poliomyelitis, J. A. M. A. **26:** 1 (Jan. 4) 1896.

3. Draper, George: Acute Poliomyelitis, Nelson's Loose-Leaf Living Medicine, New York, Thomas Nelson & Sons **2:** 67, 1926.

4. Lavinder, C. H.; Freeman, A. W., and Frost, W. H.: Epidemiological Studies of Poliomyelitis in New York City and the Northeastern United States During the Year 1916, Pub. Health Bull. 91, Washington, D. C., Government Printing Office, 1918.

5. Netter, A., and Levaditi, C.: Action microbicide exercée sur le virus de la poliomyélite aigue par le sérum des sujets antérieurement atteints de paralysie infantile: Sa constatation dans le sérum d'un sujet qui a présenté une forme abortive, Compt. rend. Soc. de biol. **68:** 855, 1910. Anderson, J. F., and Frost, W. H.: Abortive Cases of Poliomyelitis, J. A. M. A. **56:** 663 (March 4) 1911.

6. Kramer, S. D., and Aycock, W. L.: Abortive Poliomyelitis, Proc. Soc. Exper. Biol. & Med. **29:** 98 (Oct.) 1931. Abortive Poliomyelitis, editorial, J. A. M. A. **98:** 405 (Jan. 30) 1932.

with an epidemic of poliomyelitis, failed to show a higher percentage of specific protective bodies in their blood than did two control groups of children.

Our own studies, which were made in New Haven during the summer of 1931, deal with certain aspects of the same general problem; namely, What is abortive poliomyelitis? and How important is it?

Both questions were rather vividly impressed on us by the difficulties in diagnosis experienced during the recent epidemic. For practical purposes some diagnostic criteria seemed necessary and these gradually resolved themselves into the following features which were accepted as positive evidence of poliomyelitis: (*a*) the development of paralysis in association with the usual signs of the disease, with or without the association of positive manifestations of the spinal fluid; and (*b*) the presence of a pleocytosis (i. e., more than 12 cells), or a definite increase of globulin in the spinal fluid, in association with the usual signs of the non-paralytic form of the disease. Such criteria eliminate innumerable cases characterized only by sore throat, fever, vomiting or headache with or without mild stiff neck which accompany an epidemic of poliomyelitis. Obviously the accepted criteria are incomplete, but it is equally obvious that the question as to where to draw the line is difficult.

In an effort to answer some of the problems of definition in this disease, studies on the symptomatology and particularly the laboratory observations were carried out in a series of suspected cases. An analysis of these results will appear in another publication.[7] In brief, it was found that the usual diagnostic procedures including lumbar puncture were inadequate to answer the question as to whether or not we were dealing with poliomyelitis in many borderline cases. Consequently, resort was had to other methods of approach furnished by the presence of an epidemic. The first object in our epidemiologic studies was to determine the incidence of minor illnesses[8] in association with cases of bona fide poliomyelitis. Two lines of approach were used: (1) family studies and (2) community studies.

1. FAMILY STUDIES ON THE INCIDENCE OF MINOR ILLNESSES OCCURRING COINCIDENTALLY WITH POLIOMYELITIS

Following methods which have been developed by Opie and his co-workers in studying the spread of tuberculosis through families,[9] and which two of us have similarly employed in rheumatic fever,[10] data were assembled and charted in 222 families, from each of which had come one or more bona fide cases of poliomyelitis. It has been generally observed that there is but little tendency for poliomyelitis to spread in families, and in the epidemic of 1916 only 4.3 per cent of 8,634 families attacked in New York City were reported as having more than one case.[11] Furthermore, there are indications that the majority of multiple cases (80 per cent) are of common source appearing more or less contemporaneously with one another.[12] By taking advantage of the latter fact we have subjected families to a period of intensive observation on or about the time at which a known case of poliomyelitis appeared, having as our particular object the acquisition of first hand observations or of records, not only of other familial examples of recognizable poliomyelitis during this period, but also examples of any type of illness, however mild.[13]

In the course of this work it immediately became apparent that in these families the illnesses, other than those reported to the local board of health as examples of poliomyelitis, divided themselves into three groups: (A) an acute, febrile episode, characterized by sore throat, headache and vomiting, which frequently lasted only twenty-four or thirty-six hours but as a rule left the child feeling below par for several days; (B) mild upsets referable to the upper respiratory or gastro-intestinal tract, such as colds without fever or diarrhea; (C) recognizable clinical entities such as pertussis and ivy poisoning, with which we had little concern. It has been difficult to draw a sharp line between groups A and B, but the attempt has been made to restrict our use of the term characteristic minor illness only to those cases fulfilling the criteria mentioned under group A. In one of our statistical compilations, group B has, however, been included as a separate category (as in figure 3).

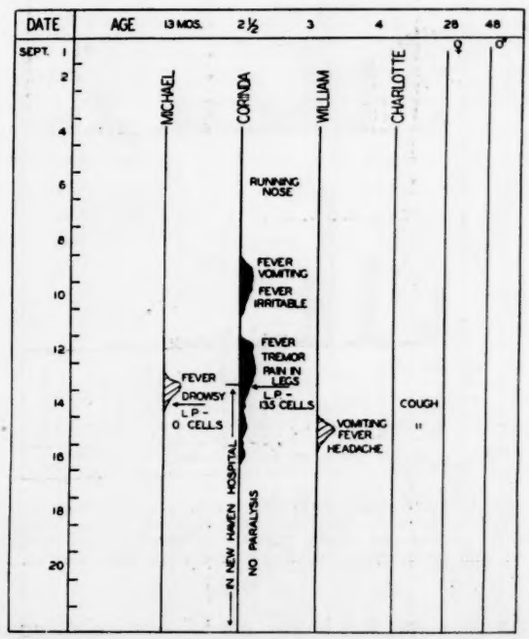

Fig. 1.—A schematic diagram of family Rn. The vertical lines indicate different members of the family; their ages appear at the top. The solid black areas indicate the onset and course of a poliomyelitic infection in one child; the shaded areas indicate the course of minor illnesses. The initials L. P., surmounted by an arrow, denote the time at which lumbar punctures were performed.

A sample family appears in figure 1. Here it will be seen that in a family with four children there occurred one case of poliomyelitis, which was followed closely by two cases of characteristic minor illness in two other children; in one of the latter, the most prom-

7. Harper, P. A., and Trask, J. D.: A Diagnostic Problem in Poliomyelitis, to be published.

8. We have employed the term minor illness in subsequent sections of this article rather than "abortive poliomyelitis." Both are vague, but many of the minor illnesses in which we have been interested present symptoms so remote from that of "abortive poliomyelitis" in the usually accepted sense that, until surer ground has been reached, the term minor illness seems preferable.

9. Opie, E. L., and McPhedran, F. M.: Spread of Tuberculosis Within Families, J. A. M. A. **87**: 1549 (Nov. 6) 1926.

10. Paul, J. R., and Salinger, Robert: The Spread of Rheumatic Fever Through Families, J. Clin. Investigation **10**: 33 (April) 1931.

11. Emerson, Haven: Monograph on the Epidemic of Poliomyelitis in New York City in 1916, New York, Dept. of Health, 1917.

12. Aycock, W. L., and Eaton, P.: The Epidemiology of Infantile Paralysis: The Relation Between Multiple Cases in the Same Family, Am. J. Hyg. **5**: 724 (Nov.) 1925.

13. We are indebted to Drs. J. L. Rice and D. M. Lewis of the Department of Health, City of New Haven, for the privilege of studying these families.

inent symptom was fever, and in the other, fever, vomiting and headache. In the youngest child the symptoms were sufficiently suggestive to warrant a diagnostic lumbar puncture, which proved negative. There are enough examples in the literature of family epidemics similar to that shown in figure 1 (notably those appearing in the reports of Taylor and Amoss [14] and Aycock and Luther [15]) to suggest that this situation

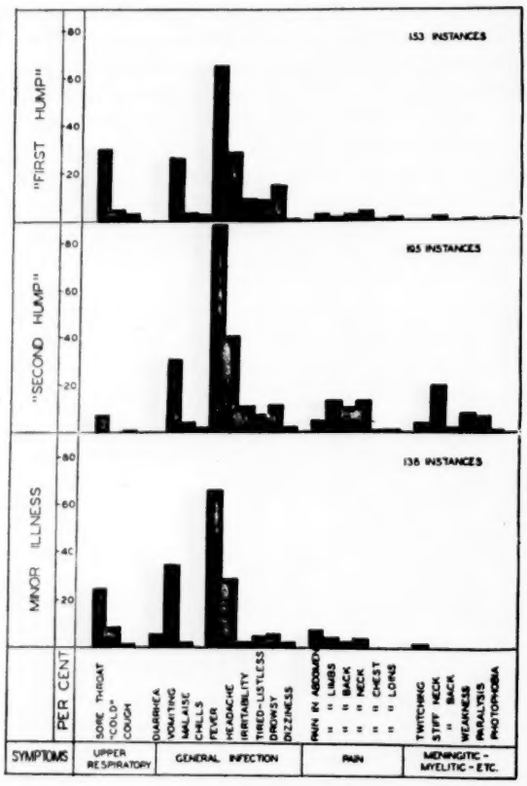

Fig. 2.—A diagrammatic representation of the percentage incidence in which different early symptoms were recorded in the histories of patients in the first and second phases or "hump" of poliomyelitis, as compared with the symptoms appearing in characteristic, familial, minor illnesses.

is not a rare one, but it was one of our main purposes to estimate the frequency with which it actually occurred. For these estimates, data and charts similar to that shown in figure 1 were prepared in all of our 222 families. They revealed that the situation shown in figure 1 is quite common. Actually it was found that, in families in which one or more cases of poliomyelitis arose, illness similar to that shown by Michael and William in figure 1 appeared among the other children in the various percentages shown in table 1.

A comparison between the high rate of incidence of these characteristic minor illnesses can be made with the results obtained from control children representing families from which no case of poliomyelitis had come. Comparable data were obtained on these control families during the epidemic period.

As we have already mentioned, these minor illnesses present a fairly characteristic, although by no means specific, clinical picture, and, furthermore, the spinal fluid obtained from lumbar punctures performed early in the illness generally fails to show abnormal conditions. In an analysis of their symptomatology, we have compared them with the two clinical phases of poliomyelitis.[16] A graphic representation of this analysis, based entirely on data obtained from the patients' histories, appears in figure 2. As is well known and as has been particularly emphasized by Draper,[3] the first phase or "hump" in the so-called dromedary type of the disease is, when present, usually characterized by symptoms of a general infection, and the second "hump" by those of infection with myelitic involvement.

TABLE 1.—*Percentages of Children with Characteristic Minor Illness*

		Age				
		Under 1	1-4	5-9	10-14	15-19
222 Poliomyelitis Families	Number of children in each age group.....	23	109	138	107	73
	Percentage with characteristic minor illness (group A)*.....	12	39	32	17	7
60 (control) Nonpoliomyelitis Families	Number of children in each age group.....	10	54	90	76	36
	Percentage with characteristic minor illness (group A)†.....	0	10	8	0	0

* Only those examples of illness are included which appeared within three weeks of the time of onset of a familial case of poliomyelitis.

† This includes illness which appeared within a period of six weeks during the time the local poliomyelitis epidemic prevailed.

In our analysis of the symptoms of 195 cases of poliomyelitis, it will be seen that first phase symptoms and early symptoms of the second phase differed from each other essentially in two respects: (*a*) by the increased presence of symptoms of the upper respiratory tract, particularly sore throat in the first "hump," and (*b*) by the presence of signs pointing to meningitic or myelitic involvement in the second. The symptomatology of the coincidental intrafamilial minor illnesses corresponds somewhat more closely to the first "hump" in that here again symptoms of involvement of the upper respiratory tract, such as sore throat, were prominent, and obviously signs of meningitic and

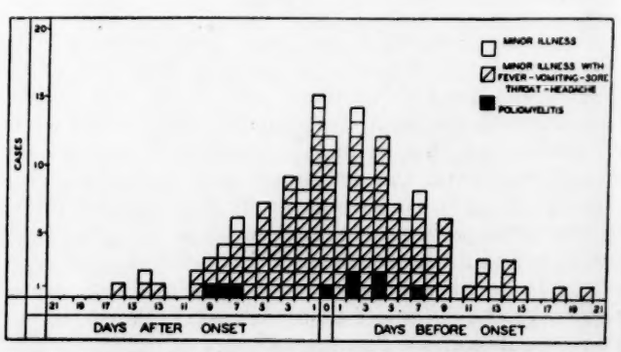

Fig. 3.—Time relationships of the onset of multiple familial cases of poliomyelitis compared with similar relationships of the onset of characteristic familial minor illnesses. Squares with a diagonal represent group A; open squares, group B.

myelitic involvement were practically absent. The inference naturally arises, therefore, as to whether these minor illnesses actually represent the first phase of poliomyelitis, as Draper believes, and it would seem that on a symptomatologic basis most of the evidence

14. Taylor, E., and Amoss, H. L.: Carriage of the Virus of Poliomyelitis, with Subsequent Development of the Infection, J. Exper. Med. **26**: 745 (Nov.) 1917.

15. Aycock, W. L., and Luther, E. H.: The Incubation Period of Poliomyelitis, J. Prev. Med. **3**: 103 (March) 1929.

16. In an unpublished clinical analysis of 195 patients with poliomyelitis, admitted to the New Haven Hospital during the summer of 1931, those showing the characteristic double phase represented 54 per cent of the series.

would point this way. However, this issue is slightly clouded by the fact that in our series of minor illnesses here again two phases or periods of illness were observed in about 10 per cent of the cases. All that can be said at the moment, therefore, is that our data on this point suggest that generally the symptomatology of the minor illness mimics that of the first phase of poliomyelitis.

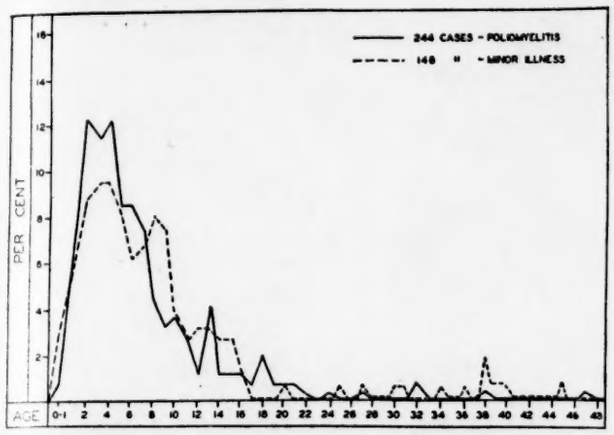

Fig. 4.—The age distribution of cases of poliomyelitis, occurring locally during the 1931 epidemic, as compared with the age distribution of characteristic minor illnesses which occurred in the families of these patients.

In figure 3 is shown the relatively close relationship in time of onset which these characteristic minor illnesses (group A), and also other less characteristic minor illnesses (group B), bore to the day of onset (zero day in fig. 3) of a familial case of poliomyelitis.[17] Similar time relationships between multiple intrafamilial cases of poliomyelitis are also shown. It is evident, therefore, not only that multiple familial cases of poliomyelitis appear more or less contemporaneously but also that minor illnesses appear more or less contemporaneously with familial cases of poliomyelitis.

Another comparison which may be made is that of the age groups affected by poliomyelitis on the one hand, and by these characteristic minor illnesses on the other. In figure 4 the age incidence of 244 cases of poliomyelitis seen in the New Haven Hospital during the summer of 1931 has been charted, together with the age incidence of 148 instances of contemporary minor illness occurring in the families of these patients. The similarity of the two curves is quite striking.

II. COMMUNITY STUDIES ON THE INCIDENCE OF MINOR ILLNESS OCCURRING COINCIDENTALLY WITH POLIOMYELITIS

Following the leads afforded by the family observations, three more or less isolated communities adjacent to New Haven were chosen for intensive study. The criteria employed in selecting the communities were that (*a*) at least two cases of poliomyelitis had occurred in the community; (*b*) the geographic limits of the community could be defined; (*c*) the size of the total susceptible (juvenile) population could be determined, and (*d*) all the families in the community could be studied.

Data from one of our community studies appear in figures 5 and 6. In figure 5 a rough diagrammatic map of the situation is shown. The community consisted of a group of summer cottages situated on the shore of Long Island Sound which were, fortunately, occupied by very intelligent and cooperative families.[18] The events that transpired in this community during the summer of 1931 are shown in figure 6; all the juvenile (i. e., under 16) members of the group have been portrayed as vertical lines, on which illnesses have been recorded by the symbols used in figure 1. It will be seen that the population was not fixed, in that families were constantly moving in or out. Late in July and early in August several cases of mild illness characterized by sore throat, fever, vomiting and headache appeared among the children, but although there was considerable apprehension by attending physicians and the community itself as to whether the illnesses might be poliomyelitis, none of them showed symptoms from which a definite diagnosis could be made, and so they were labeled "summer grip."

On August 20, a child from family 9, who had left the summer colony the week before, developed poliomyelitis, and shortly thereafter three other cases appeared among members of the colony in rather rapid succession. Meanwhile, the "summer grip" continued, although three out of five of the children who contracted it during September had arrived in the community subsequent to August 15. In all, therefore, out of forty-one children in the community there were twenty-nine instances of acute illness between July 30 and September 22. Four of these illnesses proved to be poliomyelitis. Many of the others merely consisted of fever, headache, and vomiting of one day's duration,

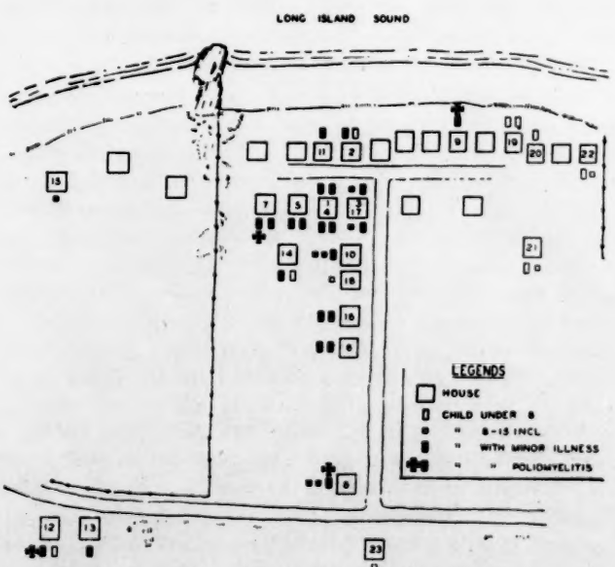

Fig. 5.—A diagrammatic map of community 3 in which are shown the total juvenile population and the number who suffered from minor illnesses or from poliomyelitis between July 25 and Sept. 25, 1931.

but some were of several days' duration; others presented two distinct phases, and not a few offered real problems in the differential diagnosis of poliomyelitis. Practically the same experiences were encountered in our two other community studies; and in all three the ratio of cases of poliomyelitis to minor illnesses proved to be practically the same, namely, 1:6. If one were to

17. In determining the time of onset of a case of poliomyelitis we have designated the first appearance of symptoms, including first phase symptoms when present, as the first day of the disease.

18. We are indebted to Dr. Millard Knowlton of the Department of Health, State of Connecticut, and to Dr. M. P. Rindge, district health officer of Madison, Conn., for the privilege of studying this community.

be so bold as to suggest that these minor illnesses were actually mild forms of poliomyelitis one would be led to the conclusion that, under the circumstances described, mild or "abortive" poliomyelitis occurred six times as frequently as did poliomyelitis in which the diagnosis could be made with certainty according to present-day criteria.

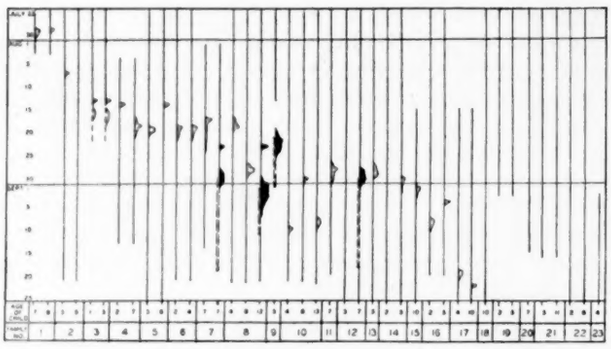

Fig. 6.—The juvenile population of community 3. The onset and course of poliomyelitis and characteristic minor illnesses is denoted by symbols similar to those used in figure 1.

A summary of the data shown thus far from our family and community studies merely goes to show that circumstantial evidence has been raised, pointing to a close relationship between the characteristic minor illness on which we have laid so much stress, and poliomyelitis. To test this circumstantial evidence from another angle, recourse was had to experimental methods.

DEMONSTRATION OF THE VIRUS OF POLIOMYELITIS IN ORAL SECRETIONS FROM CASES OF MINOR ILLNESS

It is an established fact that the poliomyelitic virus may be detected by the monkey inoculation test, in washings from the throats of acute cases of poliomyelitis,[19] but rarely from human throats under other conditions.[20] To our knowledge there are two examples of its detection in pooled nasopharyngeal washings taken from healthy familial contacts (Flexner, Clark and Fraser,[21] Kling and Pettersson [22]).[23] An important observation which has direct bearing on our studies is that of Taylor and Amoss,[14] who were successful in isolating the virus from two members of a family of four children in which three, or probably four, cases of poliomyelitis occurred. One of the successful instances was obtained from a child five days before she came down with a mild attack of the disease; the other from a child four days subsequent to the development of symptoms which recall those of our characteristic minor illnesses. The number of attempts to repeat the previously quoted observation is unknown, but it is evident from the small number of successful reports of the isolation of the virus from patients not suffering from bona fide poliomyelitis that it is not easy, and it was with rather meager hopes of success that our experiments were initiated.

The technic used was varied from time to time, and our two successful results were attained with unconcentrated as well as with concentrated washings.

The patient was instructed to gargle the throat with from 25 to 125 cc. of sterile water, or it was washed through the nasopharynx by means of a nasal catheter. The washings were collected in a flask containing glass beads, which were shaken vigorously for fifteen minutes. This material was then usually concentrated by vacuum distillation at 37 C. for a period not exceeding six hours (by this procedure we were seldom able to reduce the washings to less than a fourth of their original volume). To the concentrated washings 0.5 per cent phenol was added and the material allowed to stand for half an hour, in order to reduce the number of bacteria. This step in the procedure was employed in preference to filtration, as it has been shown that, in spite of the bactericidal properties of phenol, poliomyelitic virus may remain active in 0.5 per cent phenol for many months.[24] Between 0.5 and 1.0 cc. of the phenolized material was then inoculated intracerebrally into the brain of an etherized monkey. Material thus treated and inoculated intracerebrally into twenty monkeys gave rise to pyogenic infection, or brain

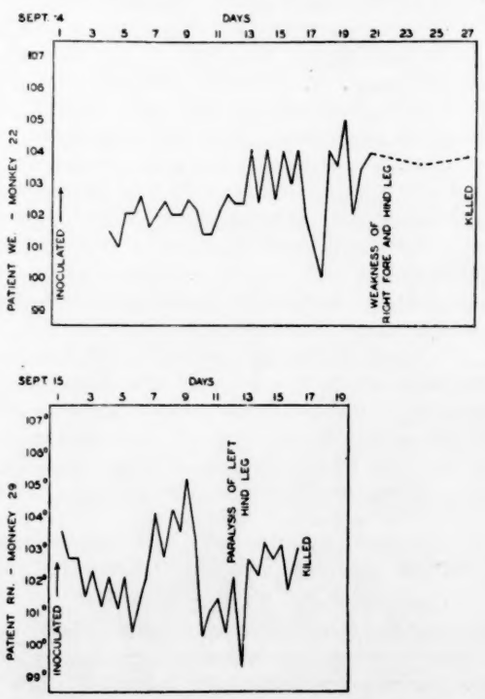

Fig. 7.—Temperature curves shown by the two monkeys (22 and 29) in which the experimental disease was produced as a result of the intracerebral inoculation of nasopharyngeal washings from two cases of minor illness.

abscess, once. Rectal temperatures were taken twice daily on all monkeys thus inoculated, for a period of three weeks. If suspicious or definite signs of paralysis developed, the animal was killed and an autopsy was done. Practically all the surviving monkeys in this

19. The literature is reviewed by Flexner, Simon, and Amoss, H. L.: Persistence of the Virus of Poliomyelitis in the Nasopharynx, J. Exper. Med. **29:** 379 (April) 1919.

20. Lucas, W. P., and Osgood, R. B.: Transmission Experiments with the Virus of Poliomyelitis, J. A. M. A. **60:** 1611 (May 24) 1913.

21. Flexner, Simon; Clark, P. F., and Fraser, F. R.: Epidemic Poliomyelitis: Fourteenth Note: Passive Human Carriage of the Virus of Poliomyelitis, J. A. M. A. **60:** 201 (Jan. 18) 1913.

22. Kling, C., and Pettersson, A.: Keimträger bei Kinderlähmung, Deutsche med. Wchnschr. **40:** 320 (Feb. 12) 1914.

23. We have recently gone over the well known work of Kling, Pettersson and Wernstedt (The Presence of the Microbe of Infantile Paralysis in Human Beings: Investigation on Epidemic Infantile Paralysis, Report from the State Medical Institute of Sweden to the Fifteenth International Congress on Hygiene and Demography, Washington, D. C. **5,** 1912) who reported the detection of poliomyelitic virus from a rather high percentage of examples of minor illness and from healthy contacts. The criteria which these authors used for the detection of the virus are so different from those in use to-day that it is difficult to evaluate their results.

24. Amoss, H. L.: Virus Diseases of Man as Exemplified by Poliomyelitis. Filterable Viruses, edited by T. M. Rivers, Baltimore, Williams & Wilkins Company, 1928.

series were subsequently tested and found susceptible to infection with a known strain of poliomyelitic virus.[25]

Oral washings from twelve examples of minor illness, three cases of poliomyelitis and four contacts, were treated in the manner described. In all, twenty monkeys were inoculated. As already stated, one monkey that had been inoculated with material obtained

Fig. 8.—Section showing characteristic lesions of poliomyelitis in the spinal cord of monkey 22; × 55.

from a supposed contact succumbed with a brain abscess on the sixth day and consequently has not been included in the series.

The results appear in table 2. Here it will be seen that from twelve tested cases of minor illness the virus was detected in two and that both of the positive results were obtained with washings taken on the first and

TABLE 2.—*Summary of Results of Monkey Inoculations with Oral Washings*

	Day of Illness or Contact on Which Washing Was Done							
	1	2	3	4	5	6-10	11-15	Total
Minor illness								
Number of cases	1	4	2	3	1	1	..	12
Number of positive results	1	1	0	0	0	0	..	2
Contacts								
Number of subjects	..	1*	1*	1*	..	..	..	3
Number of positive results	..	0	0	0	..	..	..	0
Poliomyelitis								
Number of cases	1	..	..	..	..	1	1	3
Number of positive results	0	..	..	..	..	0	0	0
Contacts								
Number of subjects	1*	..	..	..	..	..	..	1
Number of positive results	0	..	..	..	..	..	..	0

* The day of contact represents the day numbered from the onset of the last case to which the subject was intimately exposed.

second days of the disease, representing two successful attempts out of five trials during this early period. A further commentary which also seems important is that, as these minor illnesses are often very brief, two of the children were practically without symptoms on the second day and were up and playing at the time the irrigation was done. In neither of these cases was the virus detected. Therefore, of the three cases tested within forty-eight hours of the onset of the disease and in which symptoms still persisted, two furnished the virus by the methods employed.

The two patients in whom the virus was detected have already figured in previous sections of this paper. One was Michael, aged 13 months, shown in figure 1. It will be recalled that he was suspected of having poliomyelitis but that this suspicion was allayed by the presence of a negative lumbar puncture and the rapid disappearance of symptoms after twenty-four hours. The second was a child, aged 5 years, who appears as the oldest juvenile member of family 16 in figure 6.

EVIDENCES OF POLIOMYELITIS IN THE MONKEYS

Besides the development of characteristic paralysis, temperature readings have proved valuable in detecting the experimental disease in the monkey. It will be recalled that the normal temperature range of rhesus monkeys is about 102 to 103.

Kramer, Hendrie and Aycock[26] have recently described the characteristic temperature curve which appears in monkeys inoculated intracerebrally with the virus of poliomyelitis. They call attention to the fact that there may be an immediate brief rise in temperature, but this usually does not last beyond the first twenty-four hours. The incubation period or period of "normal" temperature prior to the onset of the true experimental disease generally lasts from four to eight days but at times as long as from eighteen to twenty-one days. With the onset of the disease there is an abrupt rise in temperature reaching 104 to 107. Fever may persist from one to three days before the onset of the usual recognizable symptoms, such as paralysis. With the appearance of these symptoms the temperature is already declining, and when paralysis is extensive there may be a pronounced drop to subnormal values.

Fig. 9.—Section showing characteristic lesions of poliomyelitis in the spinal cord of monkey 29; × 55.

In figure 7 are shown the temperature curves of the two monkeys (22 and 29) in which the experimental disease was produced by inoculation of washings from two of our cases of minor illness. It will be seen that

25. We are indebted to Dr. E. R. Weyer and to Dr. W. H. Park of the Bureau of Laboratories, Department of Health, City of New York, for the standardized strain of poliomyelitic virus which we used in retesting these monkeys.

26. Kramer, S. D., Hendrie, K. H., and Aycock, W. L.: Rise in Temperature Preceding the Appearance of Symptoms in Experimental Poliomyelitis, J. Exper. Med. **51**:933 (June) 1930.

they conform to the picture that has just been described. In monkey 22 (patient We.) the incubation period was about twelve days and the development of paralysis was never particularly extensive. In monkey 29 (patient Rn.), the incubation period was six days, the febrile reaction brief, the temperature quite high, and paralysis of one leg marked. Both monkeys were killed five days after the development of definite paralysis. The autopsy revealed typical lesions in the spinal cord of each animal (figs. 8 and 9). Both of the strains of virus thus isolated were subsequently passed to other monkeys. A more detailed description of this aspect of our work will appear in another publication.[27]

COMMENT

Evidence has been brought forward in this paper, more or less corroborating the experiences of many previous observers, which shows that accompanying an epidemic of poliomyelitis there appear many examples of illness with symptoms not unlike those of incipient poliomyelitis. Emphasis has been laid on the surprisingly high percentage of exposed children who present these mild symptoms and the similarity that exists between the age distribution of this group and the age distribution of those who coincidentally develop recognizable poliomyelitis. Estimates with regard to the incidence or ratio of these minor illnesses to cases of poliomyelitis have been made in three communities and in each it was found that the former were approximately six times as frequent as the latter. From two children with these minor illnesses the virus of poliomyelitis has been detected in the throat, a finding which taken in conjunction with the other observations suggests that a common causal relationship exists between such illnesses and the usually accepted entity of poliomyelitis. We are aware, however, of the possibility that these individuals might have been mere carriers of the virus and, as such, not necessarily suffering from infection with it. The consistency with which negative results are encountered among contacts and also among those who had had a minor illness but were convalescent would, however, militate against this view.

The question naturally arises: Are all these instances of minor illness, however mild they be, actually examples of so-called abortive poliomyelitis? If such is the case, the previously unsuspected high incidence of the disease might explain the ease with which it spreads, as well as the mass immunization of most adult populations to the disease; an immunization which thus becomes clinical rather than subclinical in spite of recent evidence to the contrary.[6] It seems evident, however, that the reason that suspected variant forms of the disease, which have been so often described in conjunction with epidemics of poliomyelitis, have been so belittled is that there is practically nothing specific about them. There is no obviously apparent means of recognizing them, simulating as they do so many minor infections, and as a matter of fact we seem less able to recognize them today than did Wickman almost thirty years ago. The question is an old and difficult one and we have merely raised it without presenting a practical solution; but in the face of so much suggestive evidence the crux of the problem as to whether some or all of the minor illnesses which we have listed as characteristic of those seen in the epidemic period are, in actuality, poliomyelitis would seem to be one of definition. Certainly there seems little doubt that some of the minor illnesses we have described are related to orthodox poliomyelitis. If it could be shown that, accompanying or subsequent to the development of such an illness the patient actually became immune to poliomyelitis, one might justifiably assume that he had passed through an attack of the disease. The elucidation of this problem must rest on further observations and experiments on the nature of immunity in this and other diseases, together with an appreciation as to whether the tests now at our disposal are an adequate measure of immunity to poliomyelitis.

27. Paul, J. R., and Trask, J. D.: The Detection of Poliomyelitis Virus in So-Called Abortive Types of the Disease, to be published.

SUMMARY

1. An epidemiologic study of poliomyelitis has been made in which particular emphasis is laid on the problem of so-called abortive poliomyelitis, in an effort to define this entity, to determine its relative frequency, and to uncover methods whereby it can be recognized.

2. Common usage of the term abortive poliomyelitis has proved so ambiguous that in order to define the issues in this disease we have employed the term characteristic minor illness in association with poliomyelitis, so that ground may be cleared for a critical, definitive study.

3. The symptomatology of some of these minor illnesses is more or less characteristic but not specific, being essentially that of an acute infection of short duration. Such symptoms as fever, sore throat, headache and vomiting dominate the clinical picture.

4. In a survey of 222 families in each of which one or more cases of poliomyelitis had occurred it was found that, coincidentally with the onset of the known case or cases of poliomyelitis, characteristic minor illnesses developed with a high degree of frequency in the other children of susceptible age. Thus in the age group 1 to 4 years, 39 per cent of children with familial exposure developed a minor illness and in the age group of 5 to 9, this incidence was 32 per cent. In sixty control families comparable data were obtained, showing that while the epidemic prevailed, the incidence of similar minor illnesses was about 9 per cent among local children under 10, who had not been exposed to a familial case of poliomyelitis.

5. In a survey of three communities the ratio of cases of poliomyelitis to these characteristic minor illnesses was the same in each; namely, 1:6.

6. Experiments were made in which the poliomyelitic virus was isolated from nasopharyngeal washings in two examples of these minor illnesses. Negative results were obtained in ten others.

7. In both the successful experiments of virus isolation, the nasopharyngeal washings were obtained on either the first or the second day of the disease; three other attempts to isolate the virus during this period proved negative.

8. Strong evidence is brought to bear that these minor illnesses, which are evidently more frequent than has hitherto been suspected, have a common causal relationship with orthodox poliomyelitis.

9. The question as to whether the term abortive poliomyelitis may be justifiably ascribed to these illnesses would seem to be one of definition.

THE TOXICITY OF ALLYL ALCOHOL

CAREY P. McCORD, M.D.
CINCINNATI

Allyl alcohol, C_3H_5OH, earlier came into prominence as a toxic substance through the belief that its presence in wood alcohol (methyl alcohol) as an impurity largely accounted for the toxicity of the latter substance. Allyl alcohol may be present in natural methyl alcohol in such quantities as 0.5 per cent. This attempt to shift the major responsibility for wood alcohol poisoning to its impurities proved to be unwarranted. It is now known that pure synthetic methyl alcohol possesses toxic properties essentially equal to those of the natural variety.

Genuine opportunities for injury from allyl alcohol may be found in the increasing use of this substance as an intermediate in the chemical and pharmaceutic industries. During the past year a number of workers have been damaged from exposure to allyl alcohol vapors, which fact prompted a limited experimental investigation, here reported. Earlier investigations have been reported by Miessner,[1] Carlier [2] and Atkinson.[3] The last mentioned investigator found that 0.5 cc. of allyl alcohol in 1 per cent solution, administered by mouth, produced death in dogs within about seven hours. Atkinson concludes that the toxicity based on the lethal dose is about 150 times that of methyl alcohol.

INHALATION EXPERIMENTS

Six rabbits, one monkey and sixteen white rats were subjected to the action of known concentrations of allyl alcohol, in such quantities of the vapors as 50, 200 and 1,000 parts per million of air. The exposure period was seven hours daily, although some animals did not survive that long. The method of exposing these subjects to the vapor is described in other publications.[4]

Following exposure to 1,000 parts of vapor per million of air, the one rhesus monkey, long under preliminary observation, died within four hours. Prior to death there occurred profound vomiting and diarrhea, together with every indication of severe pain. At autopsy, subcutaneous hemorrhage was noted over the abdomen; the entire intestinal tract was markedly inflamed and injected, with petechial hemorrhage throughout. The gastro-intestinal tract was empty and greatly distended. The entire spleen presented diffuse hemorrhage. Similarly, hemorrhage existed in the kidneys, and throughout the lungs extensive edema with hemorrhagic exudate was noted. Additional evidence of inflammation, with or without hemorrhage, was noted in the brain, meninges and blood vessels. The blood was uncoagulated.

Two rabbits were subjected to the same concentration. One died after three and a half hours' exposure, the other after four hours and fifteen minutes. During exposure, breathing was labored and noisy. Fluid dripped from the nose and mouth. At autopsy much free hemorrhage was found in the lungs, with lesser inflammation and hemorrhage in the intestinal tract, kidneys and bladder. The urine contained blood. In one of these two rabbits, hemorrhage was noted in the eyes, the sclerae were opaque, and the genitalia were highly inflamed. Both animals presented a marked gaseous distention of the gastro-intestinal tract.

Six rats were exposed to this concentration of 1,000 parts of vapor per million of air and were dead within three hours. The postmortem observations in the lot were the same throughout and closely resembled those found in the rabbits and in the monkey.

In another group of three rabbits and four rats, the concentration was reduced to 200 parts of allyl alcohol vapors per million of air. After one hour's exposure there existed obvious discomfort and labored, noisy breathing, with discharge of fluid from the nose and mouth. One animal survived three days' exposure (seven hours each), dying in convulsions; another survived six days' exposure, and the third survived eighteen days' exposure. During this period the labored, noisy breathing persisted, together with marked nasal and oral discharge of secretion. The autopsies on these three rabbits disclosed conditions quite similar to those found in the higher concentration, with some variations attributable to the longer period of action.

The four rats in this group succumbed on either the first or second day of exposure and presented conditions at autopsy similar to those already described.

In a third group of two rabbits and five rats, the concentration produced was 50 parts of allyl alcohol per million of air. The first rabbit died on the fourteenth day of exposure; the second survived twenty-eight days' exposure and was then killed for examination. In the first animal the conditions found at autopsy were similar to those already mentioned. In the killed animal the changes were likewise similar, with chief evidence of hemorrhage in the gastro-intestinal tract and the lungs.

The rats in this series, with one exception, died as the result of the action of allyl alcohol, the exposure period averaging about thirty days.

In general, it appears that allyl alcohol is a highly irritating chemical, leading in life to pulmonary edema, hemorrhage, gastro-enteritis, profound vomiting, distention of the gastro-intestinal tract, diarrhea, nephritis and hematoma. At autopsy, practically all tissues are highly inflamed and present hemorrhage. The lungs and gastro-intestinal tract appear to be the most involved.

A suitable number of controls did not present any of the abnormalities observed before death and at autopsy in the animals exposed to the vapor.

Tissues from these experimental studies have been examined by Dr. Ernest Scott and his associates, of the Department of Pathology of Ohio State University. Histologic changes will be reported in a separate paper. The summary of this paper on pathology includes the following: "All lesions described have been of a very acute nature. The alcohol is apparently diffused quite rapidly throughout the system. The first evidence of the injurious agent is a general congestion of all the viscera. This is followed quickly by swelling and granular degeneration of the cytoplasm of the parenchymatous cells. The cells most affected are those lining the convoluted tubules of the kidney, the liver cord cells, myocardium, and the ganglion cells of the spinal cord and of the retina. This swelling and parenchymatous change is followed directly by cellular necrosis

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2. Carlier, E. W.: Notes on the Physiology of Some of the Allyl Compounds, Brit. M. J. **2**: 609, 1911.

3. Atkinson, H. V.: Toxicity of Impurities in Wood Alcohol: I. Allyl Alcohol, J. Pharmacol. & Exper. Therap. (proceedings) **25**: 144, 1925.

4. McCord, C. P.: A New Investigation of the Toxicity of Benzol and Its Impurities, Transactions of National Safety Council, 19th Annual Safety Congress (Chemical Section), 1930; Toxicity of Methyl Alcohol (Methanol) Following Skin Absorption and Inhalation, Indust. & Engin. Chem. **23**: 931 (Aug.) 1931.

without any evidence of wandering cell infiltration. . . . The general congestion of the lungs is followed by edema and compensatory emphysema."

COMMENT AND SUMMARY

Among workers the damage from allyl alcohol has been limited to severe irritation of the mucous membranes, with edema and excessive secretion, together with conjunctivitis and lacrimation. The physical properties of this alcohol are such as to provide due warning of its presence. Since, under ordinary room conditions of temperature and air pressure, 1 cc. of the liquid allyl alcohol will produce about 362 cc. of vapors, it is obvious that dangerous concentrations may readily arise. The threshold of danger from inhalation is well below 50 parts of vapor per million of air, but it is improbable that allyl alcohol may be regarded as 150 times as toxic as methyl alcohol through this portal of entry. Concentrations below 5 parts per million will produce some irritation, and for practical purposes the atmosphere of work places should be kept below this point. Completely closed systems are highly desirable in the manipulation of this toxic industrial chemical.

34 West Seventh Street.

PROPHYLAXIS OF THE ANEMIA OF PREMATURE INFANTS

USE OF VARIOUS AGENTS IN ATTEMPT TO PREVENT DEVELOPMENT OF THE SO-CALLED PHYSIOLOGIC ANEMIA OF PREMATURE INFANTS: PRELIMINARY STUDY

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The anemia that regularly occurs in premature infants during the first quarter year of life has been known and recognized as a clinical entity since Gundobin [1] first reported his observations on this condition.

For the first days after birth the blood of the premature infant shows high values for hemoglobin content and number of erythrocytes, similar to the values found in the full term new-born infants. At this period fetal characteristics such as erythroblastosis and polychromia are present to a higher degree in the blood of the premature than of the full term infant.

Regularly during the first three months there is noted a marked drop in the hemoglobin and the red count, beginning from the fourth to the fifth week of life and reaching their lowest values between the eighth and the twelfth week. Thereafter, a gradual improvement in both the erythrocyte count and the hemoglobin content of the blood are noted, until values are reached at the sixth to the eighth month of life which compare normally with those of the full term infant.

The more premature the infant and the lower its birth weight, the more severe the anemia that is likely to develop.[2]

It must be clearly understood that all workers on this anemia have reported their observations from otherwise healthy premature infants, so that such factors as infection, hemorrhage or ailmentary or nutritional disturbances are *a priori* excluded. The anemias of congenital syphilis, or those developing after severe infections or nutritional disturbances in the new-born or premature infant in the first six months of life, have their definite etiology and must be recognized as entirely distinct types from those occurring in otherwise healthy premature infants.

While many of the earlier observations were made on infants from the lower social strata, in infant asylums and crèches, there have been enough observations on premature infants of the upper classes to prove that the anemia develops just as severely and regularly in infants from the latter social group.

It was early believed that the type of milk or feeding might have some influence on the development of the anemia, but whether the feeding is entirely breast milk or modifications of cow's milk makes not the slightest difference in the degree of anemia developed. The early addition of vitamins, orange juice, cod liver oil or viosterol does not prevent the development of the anemia.

SYMPTOMATOLOGY

This anemia has been termed physiologic anemia [3] and also hypoplastic anemia [4] of premature infants.

The symptomatology of this anemia is often marked by intense pallor; the skin has a waxy or white sheet color. The ear lobes are pale and transparent and the mucous membranes and nailbeds are markedly pale. Enlargement of the spleen is uncommon; the liver is occasionally found slightly enlarged. Kunckel [5] reported that premature infants whom he was able to keep out in the fresh air showed a rosy skin color despite the anemia which they developed. The appetite and general well being of these infants is in no way impaired, and they show no elevations of temperature or constitutional derangements. No immunologic studies are available to show that this anemia renders them more subject to infection.

The blood of this anemia is characterized by an equally marked reduction in erythrocyte and hemoglobin values with disappearance of the erythroblastosis and polychromia. The latter finding is in marked contrast to the prevalence of these elements in the blood of premature infants during the first few days of life.

EXPERIMENTAL DATA

The experimental work here reported was carried on in a special ward for premature infants, under ideal and exemplary conditions. After the infants were discharged from the hospital they were followed in the outpatient department, returning at intervals to a special premature clinic.

All infants selected were healthy premature infants; i. e., there was no history or sign of syphilis, hemorrhage, infection or other disorder that might be taken as a cause for anemia. In our work we have divided them into two distinct classes: those born after six to seven months' gestation and those born after eight months' gestation. This was necessary because it has

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Inaugural thesis, read before the Chicago Pediatric Society, Feb. 16, 1932.

From the Premature Infant Station, Sarah Morris Hospital for Children, and the Nelson Morris Institute for Medical Research, Michael Reese Hospital. Aided by grants from the Infants Aid Society and the Albert B. Kuppenheimer Fund.

1. Gundobin, N. P.: Ueber die Morphologie und Pathologie des Blutes bei Kindern, Jahrb. f. Kinderh. **5**: 204, 1893.

2. Landé, Lotte: Beitrag zur Haematologie, Aetiologie und Therapie der Frühgeburtenanämie, Ztschr. f. Kinderh. **22**: 295 (Nov.) 1919; Zur Eisentherapie der Frühgeburtenanämie, ibid. **42**: 349, 1926.

3. Finkelstein, H.: Ueber die Anämien des frühen Kindesalters, Berl. klin. Wchnschr. **48**: 1829, 1911; Lehrbuch des Säuglingskrankheiten, ed. 3, Berlin, Julius Springer, 1924, p. 752.

4. Lichtenstein, A.: Hämatologiska studies a för tidigt födda born, Svenska läk.-sällsk. handl. **43**: 1533 (Dec.) 1917; Der Eisenumstaz bei Frühgeborenen, Acta pædiat. **1**: 194, 1921.

5. Kunckel, D.: Zur Kenntnis der Blutveränderungen bei Frühgeburten und debilen Kindern, Ztschr. f. Kinderh. **13**: 101 (July) 1915.

been shown that the more premature the infant and the less the birth weight, the more severe the anemia. This group differentiation was likewise made with the control series.

The infants in this station [6] are all placed in the Hess incubator bed for premature infants, and heat is maintained by this means. The routine feeding is

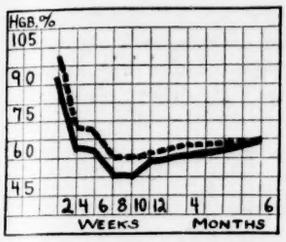

Chart 1.—Hemoglobin in control premature infants. In charts 1 and 2 the broken line indicates the infants of eight months' gestation and the solid line those of from six to seven months' gestation.

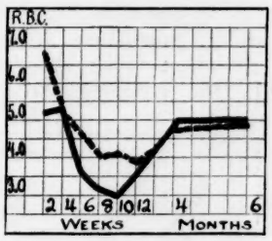

Chart 2.—Red blood cells in control premature infants.

breast milk obtained from tested wetnurses who live in the hospital and express their milk under direct control of the supervising nurse of the premature station.

After the infants are older and have attained sufficient weight, such substitute feedings as skimmed lactic acid milk (buttermilk), whole buttermilk, chymogen milk, evaporated milk and whole milk modifications are adopted, according to the need of the infants. Orange juice and cod liver oil are started early, from the second to the third week after birth; cereals from the fourth to the fifth month, and vegetables from the fifth to the sixth month. The infants were followed for from six to seven month periods, after which time the erythrocyte and hemoglobin values had returned to normal figures for this age group.

Prophylactic Agents Used and Dosages.—The first group of premature infants was started on a dried liver extract fraction suitable for secondary anemia, made according to the formula of Whipple and Robscheit-Robbins.[7] Two complete blood determinations were made during the first week of life, and then the dried liver extract was administered at the beginning of the second week of life and kept up continuously, with daily dosages throughout the experiment. The initial dosage of liver extract was 0.5 Gm. twice daily, increased with age to 1 Gm. twice daily and up to 3 Gm. twice daily as the infant gained and grew older.

In another series a preparation of desiccated hog stomach, prepared under the direction of Isaacs and Sturgis [8] and purchased on the open market, was employed in similar dosages and started after the first week of life.

In the largest series a preparation of dried liver fraction with iron was employed. The liver in this preparation was in the form of the dried liver fraction suitable for secondary anemia, made according to the formula of Whipple and Robscheit-Robbins.[7] The iron in this preparation was in the form of ferrous ammonium citrate. Each level teaspoonful of this empiric formula contains approximately 3.75 Gm. of liver fraction and 0.65 Gm. (10 grains) of ferrous ammonium citrate. The initial dosages started with from 1 to 2 Gm. twice daily and were increased up to 4 Gm. twice daily as the infants grew older. This preparation, which was started after the first week of life, was easily and well tolerated in these doses and caused no disturbance in the infants' digestion, feedings or stools. The amount fed twice daily was mixed with 1 drachm (4 cc.) of the milk mixture and was given at the end of a feeding. As the infants grew older the liver-iron preparation was given in from one-half to one ounce of milk formula.

The control group of infants was in the same ward under identical conditions of nursing, maintenance of heat, diet and hygienic care. Whenever possible, premature twins were used, one as a control and one as an experimental subject.

TABLE 1.—*Control Series*

Control Infants	Birth Weight, Gm.	1 Week		2 Weeks		4 Weeks		6 Weeks		8 Weeks		10 weeks		12 Weeks		4 Months		6 Months	
		Red Blood Cells	Hemoglobin, per Cent	Red Blood Cells	Hemoglobin, per Cent	Red Blood Cells	Hemoglobin, per Cent	Red Blood Cells	Hemoglobin, per Cent	Red Blood Cells	Hemoglobin, per Cent	Red Blood Cells	Hemoglobin, per Cent	Red Blood Cells	Hemoglobin, per Cent	Red Blood Cells	Hemoglobin, per Cent	Red Blood Cells	Hemoglobin, per Cent
Premature Infants of from 6 to 7 Months' Gestation																			
1	1,505	...	...	...	...	...	...	...	...	3.6	55	...	...	...	...	5.0	63	...	...
2	2,225	...	...	...	...	...	...	...	...	3.0	54	...	...	...	...	...	...	...	...
3	1,460	...	...	...	...	...	...	...	...	...	...	...	...	3.6	60	...	...	...	...
4	2,510	...	...	...	...	5.4	63	...	...	...	...	...	...	...	...	...	...	...	...
5 (2 days)	1,110	...	...	...	...	...	...	...	...	...	...	3.8	65	...	...	...	...	...	...
6	1,760	5.8	116	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	1,590	6.5	103	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	2,330	...	...	5.2	95	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	2,340	...	...	...	...	...	...	...	...	...	...	2.6	50	...	...	...	...	...	...
10	1,470	...	...	...	...	...	...	3.6	63	...	...	...	...	...	...	...	...	...	...
11	2,015	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4.9	68
Average		6.1	109	5.2	95	5.4	63	3.6	63	3.3	54	3.2	55	3.6	60	5.0	63	4.9	68
Premature Infants of 8 Months' Gestation																			
12	2,400	6.2	100	6.0	98	4.4	80	4.8	75	4.2	66	...	...	4.0	64	...	...	5.0	70
13 (girl)	1,870	8.0	100	7.6	104	6.6	90	5.9	85	4.0	45	3.9	60	4.1	60	4.8	70	4.9	70
14	2,400	...	...	...	...	5.1	68	4.4	65	4.4	65	4.5	65	...	...	5.7	65	5.6	65
15	2,000	4.8	88	...	...	4.7	70	...	...	3.7	64	...	...	3.7	65	4.6	60	4.8	70
16 (9 days)	1,420	...	...	...	...	...	...	4.2	75	...	...	...	...	...	...	...	...	...	...
17	2,230	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4.3	65
18 (34 days)	2,240	...	...	...	...	...	...	...	...	...	...	...	...	3.9	65	...	...	4.8	75
19	2,230	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5.0	71
20	1,920	...	...	...	...	...	...	...	...	...	...	...	...	3.6	60	...	...	...	...
21 (girl)	1,920	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4.0	70	...	...
Average		6.3	96	6.8	101	5.2	74	4.8	75	4.0	60	4.2	63	3.8	63	4.7	66	4.9	69

6. Hess, J. H.: Premature Infants, General Hygiene and Environment, in Abt, I. A.: Pediatrics, Philadelphia, W. B. Saunders Company **2**: 456, 1923.

7. Whipple, G. H.; Robscheit-Robbins, F. S., and Walden, G. B.: Am. J. M. Sc. **179**: 628 (May) 1930.

8. Isaacs, Raphael; and Sturgis, C. C.: Some Newer Remedies in the Treatment of Pernicious Anemia: Desiccated Stomach, J. A. M. A. **95**: 585 (Aug. 23) 1930.

HEMATOLOGIC METHODS

Erythrocyte and leukocyte counts, hemoglobin determinations, platelet counts, reticulocyte percentages and differential counts were taken on the premature infants at weekly intervals while they were in the hospital and at biweekly intervals after the infants were discharged. United States standard pipets and a Thoma Levy hemocytometer were used for all erythrocyte and leukocyte counts. Physiologic solution of sodium chloride was used to dilute the erythrocytes and 3 per cent solution of acetic acid for the leukocytes. William's improved Newcomer hemoglobinometer was used for hemoglobin determinations, and platelet counts were made by the direct method. The estimation of the reticulocyte percentages were made from counts of 1,000 erythrocytes on blood films, vitally stained with brilliant cresyl blue and counterstained with Wright's stain. Differential counts were made on cover glass, evenly spread blood films stained with May-Greenwold Giesma stain. The blood was obtained by pricking the heel, finger or ear lobe of the infant, so that a free flow was obtained.

The complete protocol record for each infant may be seen in table 5. The effect of prematurity on the red cell count and hemoglobin content is illustrated in table 1 and in charts 1 and 2 for the control series. The shorter the intra-uterine life or the more premature the infant, the more severe was the anemia that developed.

The red blood cells were of normal shape and size at birth, and in those infants who developed anemia with erythrocyte and hemoglobin values under 3 million and 45 per cent, respectively, anisocytosis and poikilocytosis were noted. These changes were most marked, the more severe the anemia.

Nucleated red blood cells and polychromia of the erythrocytes were present and both were in normal numbers for premature infants. This is more pronounced in the premature than in the full term infant.

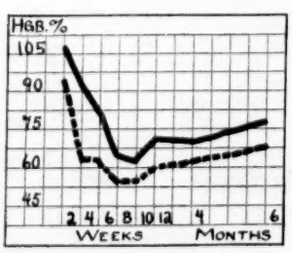

Chart 3.—Hemoglobin in premature infants of from six to seven months' gestation given liver fraction and iron. In charts 3, 4, 5 and 6 the solid line indicates infants given liver fraction and iron and the broken line indicates the control.

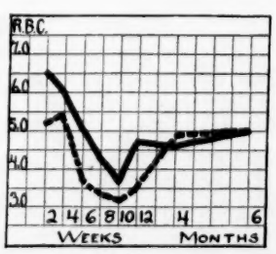

Chart 4.—Red blood cells in premature infants of from six to seven months' gestation given liver fraction and iron.

By the fourth week of life these elements have disappeared, and they do not again reappear during the course of the anemia.

The reticulated red blood cells are highest in number at birth and in the first few weeks of life and thereafter retain a more or less constant level, regardless of the administration of liver fraction, desiccated hog stomach or liver fraction and iron in combination. We were unable to confirm the observations of Frank,[9] who found an increase in reticulocytes with the administration of ferrum reductum. Yang and Keefer[10] have recently reported on the response of reticulocytes in secondary anemia following administration of liver and of liver and iron to adults suffering with malaria, hookworm anemia, and other conditions. Evidently physiologic anemia of prematurity does not show the reticulocyte response that the administration of these substances can produce in certain anemias of the adult.

The hematologic studies of the white blood corpuscles in the premature infants here investigated showed no deviation from the normal age-for-age values noted in the comprehensive studies of other observers.[11]

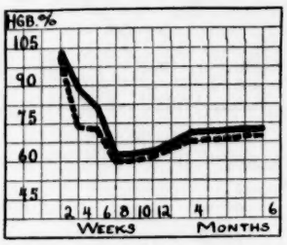

Chart 5.—Hemoglobin in premature infants of eight months' gestation given liver fraction and iron.

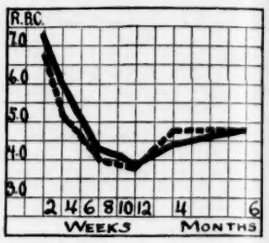

Chart 6.—Red blood cells in premature infants of eight months' gestation given liver fraction and iron.

Unlike the disappearance of normoblasts and polychromia in the red cells, there is no sign of hematopoietic insufficiency in the leukocytic cells.

RESULTS

The prophylactic value of liver fraction alone and desiccated hog stomach alone in the small series of cases in which they were tried gave average results which compare so closely with our control figures that we cannot claim beneficial results for them. Their early and continuous administration did not seem to prevent the development of physiologic anemia of the premature infant (tables 2 and 3). The premature infants of from six to seven months' gestation in these series developed as severe an anemia as our control groups, and those of eight months' gestation, who were larger premature infants, also averaged as comparatively severe anemias as were found in the control series.

The results of the administration of liver fraction and iron in combination, in the series here reported, show a definitely less severe anemia when the averages are compared with control groups for premature infants of from six to seven months' and eight months' gestation (table 4, charts 3, 4, 5 and 6).

The most beneficial results seem to have been obtained in the six to seven month groups, in which there can be no doubt that high averages have been maintained for both red blood cells and hemoglobin values.

COMMENT

The use of various therapeutic agents in attempts to cure the anemia of prematurity has led to considerable controversy in the reports of various observers. Few, if any, adequate prophylactic attempts have been made to prevent the development of this anemia. This is easily understood when it is realized that such a procedure must be commenced very shortly after birth, as the anemia is so rapid in development. These infants

9. Frank, Max: Studien ueber die Frühgeburtenanämie, Monatschr. f. Kinderh. **37**: 468 (Dec.) 1927.

10. Yang, C. S., and Keefer, C. S.: The Response of the Reticulocytes in Secondary Anemia Following Various Forms of Treatment, Arch. Int. Med. **45**: 456 (March) 1930.

11. Landé (footnote 2). Lichtenstein (footnote 4). Herz, Oskar: Hämatologische Untersuchungen an Frühgeburten, Monatschr. f. Kinderh. **40**: 1 (Aug.) 1928.

must be started with prophylactic medication within the first ten days to two weeks after birth if the anemia which becomes evident at the sixth to the eighth week is to be prevented.

Iron Therapy.—There is a disagreement among various observers on the prophylactic and therapeutic use of iron and its effect on this anemia.[12] Lichtenstein [4] (1917) stated that iron therapy in large doses has a curative effect on the anemias of premature usually occurs. Her conclusions are drawn from a series of eight cases.

Iron.—Besides the lack of clinical agreement on the therapeutic effect of iron in premature anemia, there is a general lack of agreement on the benefits of the oral administration of iron in any type of secondary anemia.[13]

It has been shown experimentally, in anemia due to hemorrhage in dogs, that above a certain optimal intake

TABLE 2.—*Desiccated Hog Stomach Administered Prophylactically*

		Premature Infants of from 6 to 7 Months' Gestation															
		1 Week		2 Weeks		4 Weeks		6 Weeks		8 Weeks		10 weeks		12 Weeks		4 Months		6 Months	
Infants Given Desiccated Hog Stomach	Birth Weight, Gm.	Red Blood Cells	Hemoglobin, per Cent	Red Blood Cells	Hemoglobin, per Cent	Red Blood Cells	Hemoglobin, per Cent	Red Blood Cells	Hemoglobin, per Cent	Red Blood Cells	Hemoglobin, per Cent	Red Blood Cells	Hemoglobin, per Cent	Red Blood Cells	Hemoglobin, per Cent	Red Blood Cells	Hemoglobin, per Cent	Red Blood Cells	Hemoglobin, per Cent
22.....	1,990	6.8	130	6.8	124	6.7	95	...	...	...	...	...	...	4.4	56	5.2	53	5.4	60
23.....	1,575	6.4	98	6.1	96	5.0	70	4.2	60	3.8	50	3.7	50	4.1	62	4.9	68	5.3	75
Average.....		6.6	114	6.4	110	5.8	82	4.2	60	3.8	50	3.7	50	4.2	59	5.0	60	5.3	67
		Premature Infants of 8 Months' Gestation																	
24.....	1,870	7.9	124	9.4	106	7.6	106	7.0	80	...	...	5.4	65	5.2	65	5.8	65	5.6	71

TABLE 3.—*Liver Fraction Alone Administered Prophylactically*

		Premature Infants of from 6 to 7 Months' Gestation															
		1 Week		2 Weeks		4 Weeks		6 Weeks		8 Weeks		10 weeks		12 Weeks		4 Months		6 Months	
Infants Given Liver	Birth Weight, Gm.	Red Blood Cells	Hemoglobin, per Cent	Red Blood Cells	Hemoglobin, per Cent	Red Blood Cells	Hemoglobin, per Cent	Red Blood Cells	Hemoglobin, per Cent	Red Blood Cells	Hemoglobin, per Cent	Red Blood Cells	Hemoglobin, per Cent	Red Blood Cells	Hemoglobin, per Cent	Red Blood Cells	Hemoglobin, per Cent	Red Blood Cells	Hemoglobin, per Cent
25....(6 days)	940	...	...	...	...	...	...	...	...	2.1	41	3.4	45	...	...	...	...	5.4	45
		Premature Infants of 8 Months' Gestation																	
26....(5 days)	2,115	6.6	111	6.4	100	5.5	100	4.7	71	...	...	4.0	60	4.5	68	5.3	85	5.4	85
27.....	1,800	10.0	116	...	...	6.7	95	6.6	95	4.8	75	5.2	68	5.2	78	5.2	70	5.2	80
Average.....		8.3	113	6.4	100	6.1	97	5.6	83	4.8	75	4.6	64	4.8	73	5.2	77	5.3	82

TABLE 4.—*Liver Fraction with Ferrous Ammonium Citrate Administered Prophylactically*

		Premature Infants of from 6 to 7 Months' Gestation															
		1 Week		2 Weeks		4 Weeks		6 Weeks		8 Weeks		10 weeks		12 Weeks		4 Months		6 Months	
Infants Given Liver and Iron	Birth Weight, Gm.	Red Blood Cells	Hemoglobin, per Cent	Red Blood Cells	Hemoglobin, per Cent	Red Blood Cells	Hemoglobin, per Cent	Red Blood Cells	Hemoglobin, per Cent	Red Blood Cells	Hemoglobin, per Cent	Red Blood Cells	Hemoglobin, per Cent	Red Blood Cells	Hemoglobin, per Cent	Red Blood Cells	Hemoglobin, per Cent	Red Blood Cells	Hemoglobin, per Cent
28.....	1,610	7.8	140	7.8	120	7.2	88	...	...	5.4	62	...	...	...	...	4.3	65	4.6	78
29.....	1,690	6.0	116	6.2	102	6.3	100	5.9	71	5.4	75	4.2	70	4.3	70	5.1	71	...	...
30....(4 days)	1,385	...	...	5.4	88	5.3	88	5.0	88	3.6	63	3.6	55	4.4	59	...	...	...	...
31.....	1,690	7.2	120	...	...	5.7	108	...	...	4.1	60	3.8	60	...	...	4.5	78	5.7	71
32.....	1,315	...	...	...	...	...	...	4.2	70	3.7	80	3.6	53	4.4	69	4.6	80	...	...
33.....	1,665	...	...	...	...	...	...	4.9	88	3.8	73	3.6	53	5.7	83	4.8	80	...	...
Average.....		7.0	128	6.4	103	6.0	96	5.0	79	4.3	68	3.6	58	4.7	70	4.6	74	5.0	74
		Premature Infants of 8 Months' Gestation																	
34.....	2,580	8.0	100	8.0	102	6.2	88	5.2	75	...	...	5.2	68	...	...	5.2	83	5.5	78
35 (boy)....	2,000	8.0	100	7.9	95	7.8	95	5.3	80	4.5	65	4.5	70	4.4	75	4.2	72	4.4	75
36.....	2,165	...	...	...	...	6.1	84	...	...	5.5	60	5.1	73	4.4	70	5.0	73	...	...
37.....	2,500	7.4	110	6.8	108	6.2	88	...	...	3.9	50	3.2	53	3.4	59	4.4	71	5.0	71
38.....	2,135	6.6	92	...	...	5.4	70	4.1	68	3.9	68	3.5	70	...	...	4.7	71	5.1	73
39.....	2,100	6.6	103	6.2	98	4.8	70	5.6	75	3.9	70	3.3	55	3.9	60	4.0	60	4.4	53
40 (girl)....	1,730	7.0	118	...	...	5.8	110	5.6	103	4.5	72	...	...	3.5	66	3.7	60	4.6	75
Average.....		7.2	103	7.2	100	6.0	86	5.1	80	4.3	64	4.1	64	3.9	66	4.4	70	4.9	70

infants. The same author [4] (1921) concludes that his prophylactic attempts at prevention of premature anemia with iron medication were unsuccessful. Lotte Landé [2] (1919) did not consider and disapproved of alimentary medication, using intramuscular blood therapeutically. In a second article [2] (1926) she states that by feeding large doses of ferrum reductum, from 1 to 2.5 Gm. daily, she was able to prevent, to some extent, the development of as severe an anemia as level a large excess of iron gives no further rise in the production of hemoglobin. In these experiments the type of iron salt given seemed to make no difference, whether it was fed as ferrous chloride, ferric citrate, ferrous carbonate, ferrous ammonium sulphate or other iron salts.

The exact mechanism of the action of iron in blood regeneration in secondary anemias is still unknown. It may simply supply the needed lack of iron; it may

12. Baar, Heinrich; and Stransky, Eugen: Die klinische Hämatologie des Kindesalters, Leipzig, Franz Deuticke, 1928, pp. 46-49.

13. Iron in Anemia, editorial, Intern. M. Digest 18: 252 (April) 1931.

stimulate hematopoietic function either directly or by indirect stimulation of internal body metabolism; or it may act as a catalyzing or oxidizing agent, either in the blood itself or on hematopoietic organs.

Frank [9] stated that, by the administration of ferrum reductum, he was able to some extent to prevent the development of physiologic anemia of premature infants, and also, by vital staining, he demonstrated considerable increase in reticulated erythrocytes. The latter observation has not been substantiated by other observers and was not noted in the series of cases here reported.

Other observers have been unable to substantiate the results of Lotte Landé and Frank [9] and have found that the prophylactic feeding of iron starting in the first few weeks of life will not prevent or alter the development of physiologic anemia.[14]

Langstein and Edelstein [15] and others measured the iron metabolic balance for full term infants and found a small positive surplus. Lichtenstein,[4] on the contrary, found a small negative iron balance for premature infants. The exact iron resorption is difficult to measure, and so far remains undetermined, and may be a factor in the etiology of the anemia. Lichtenstein concludes that of large doses of administered iron only a very minute quantity is resorbed and retained, though the possibility exists of changing the negative to a positive balance by feeding massive doses of iron.

Effect of Heliotherapy on Anemia.—It has been mentioned that Kunckel [5] showed that those infants whom he was able to keep outdoors developed anemia although they had a more rosy color than those kept indoors. Pfaundler [16] and others have believed that restriction and lack of sunlight might be a causatvie factor in the development of anemia. Sanford [17] in working on the effects of irradiation of new-born infants with ultraviolet rays was able to show a transient rise in erythrocyte and hemoglobin values.

In reviewing the literature, Hoeffel and Lyons [18] conclude that there is no justification for the belief that light rays, including ultraviolet rays, have any lasting specific effect on the hemoglobin and erythrocyte values of the blood. They have pointed out a slight seasonal variation in the values, but Landé [2] (1919) and others have shown that the anemia develops with equal severity in premature infants at all seasons of the year.

Furthermore, it has been shown by numerous authors [19] that cod liver oil and irradiated ergosterol have no effect on prevention of anemia in full term infants. Wundt's [20] claims for the proprietary preparation Ferronovin (which contains dried fish liver, iron and irradiated ergosterol) as having a preventive value in prophylaxis and therapeutic effect of physiologic anemia have been conclusively refuted by Ulmer.[21] Similarly the use of small doses of egg yolk,[22] even though added to the diet early, has never been successful in preventing the development of this anemia.

Liver and Iron.—The recent work of Whipple and Robscheit-Robbins [23] has demonstrated that a liver fraction which contains from 65 to 70 per cent of the potency of whole liver and probably a number of active substances, and which represents only 3 per cent of the weight of whole liver, is an effective therapeutic agent

TABLE 5.—*Complete Protocol Used for All Premature Infants* *

	Williams I								Williams II							
Medication	1 to 4 Gm. b.i.d. liver fraction with iron (ammonium citrate)								Control: no medication							
Age	4 days	4 wks.	5 wks.	8 wks.	12 wks.	4 mos.	5 mos.	6 mos.	4 days	4 wks.	5 wks.	8 wks.	12 wks.	4 mos.	5 mos.	6 mos.
Date	3/23/31	4/15/31	4/20/31	5/13/31	5/11/31	7/9/31	7/30/31	9/3/31	3/23/31	4/15/31	4/20/31	5/13/31	6/11/31	7/9/31	7/30/31	9/3/31
Red blood cells	7.0	5.8	5.6	4.5	3.5	3.7	4.0	4.6	4.8	4.7	4.5	3.7	3.7	4.6	4.4	4.8
Hemoglobin, per cent	118	110	103	72	66	60	74	75	88	70	75	64	65	60	53	70
White blood cells	10,700	24,000	21,600	24,400	16,100	18,800	17,000	18,000	8,400	16,000	12,000	13,300	.....	10,500	10,000	11,000
Platelets	320,000	320,000	400,000	400,000	400,000	320,000	250,000	400,000	280,000	320,000	360,000	320,000	240,000	330,000	310,000	360,000
Polymorphonuclears, per cent	46	34	50	23	35	40	33	32	56	42	48	33	16	25	32	46
Lymphocytes, per cent	48	57	36	69	55	55	62	59	35	40	43	57	77	69	66	47
Basophils, per cent	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0
Eosinophils, per cent	1	1	3	1	3	0	3	1	4	7	3	1	0	2	2	1
Large mononuclears, per cent	4	8	9	7	7		1	7	4	10	5	6	7	3	0	6
Premature white blood cells	Myl. 1	Myl. 0	Myl. 0	Myl. 0	Myl. 0	Myl. 0	Myl. 1	Myl. 1	Myl. 1	Myl. 1	Myl. 1	Myl. 1	0	Myl. 1	0	0
Nucleated red	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
Reticulocytes, per cent	3	0.25	0.25	1	0.5	0	0	0	4	0.25	0.25	0.05	1.2	0	0	2
Birth weight	1,730	.....	.....	.....	.....	.....	.....	.....	2,000							
Infant's weight, Gm.	1,635	1,885	1,990	2,270	2,520	3,180	3,660	4,570	1,780	2,025	2,145	2,425	2,905	3,515	4,120	5,255
Feedings	Breast milk, tea	Breast milk, Slam	Breast milk, Slam	Chy. breast milk, Dm.	Chy. Dm. Wlam	Chy. Dm. Wlam	Chy. Dm. Wlam	Chy. Dm. Wlam	Tea, breast milk	Breast milk, Slam	Breast milk, Slam	Chy. breast milk, Dm.	Chy. Dm. Wlam	Chy. Dm. Wlam		

* These infants were white twins of eight months' gestation. The control twin was slightly heavier and larger.

14. Silberschmidt, Paul: Wirkt Eisen bei der Frühanämie der Frügeburten? Jahrb. f. Kinderh. **129:** 63 (Sept.) 1930. Hottinger, A.: Ueber die Aufzucht Frühgeborenen Kinder im Basler Kinderspital, Jahrb. f. Kinderh., supplement 20, 1928, p. 32. Peiper, Albrecht: Erfahrungen bei der Aufzucht von Frühgeburten, Deutsche med. Wchnschr. **55:** 310 (Feb. 22) 1929.

15. Langstein, L., and Edelstein, E.: Der Eisenhaushalt im Säugling, Verhandl. d. XXX Versamml. d. Ges. f. Kinderh., 1913, p. 3.

16. Pfaundler, M.: Pathologie des Blutes und der Blutungsbereitschaft, Lehrbuch der Kinderheilkunde, ed. 10, Jena, E. Feer, Gustav Fischer, 1930, p. 130.

17. Sanford, H. N.: Effect of Ultraviolet Light on the Blood of New-Born Infants: II. Erythrocytes and Hemoglobin, Am. J. Dis. Child. **35:** 9 (Jan.) 1928; Changes Occurring in the Blood of the New-Born Following Ultraviolet Therapy, Arch. Physical Therapy **11:** 101 (March) 1930.

18. Hoeffel, Gerald; and Lyons, Dorothy: Heliotherapy and the Peripheral Blood, Am. J. Dis. Child. **40:** 484 (Sept.) 1930.

19. Lichtenstein (footnote 4). Hess, J. H.; Poncher, H. G.; Dale, M. L., and Klein, R. I.: Viosterol (Irradiated Ergosterol): Prophylactic and Therapeutic Dosage, J. A. M. A. **95:** 316 (Aug. 2) 1930.

20. Wundt, Nora: Die Anämieprophylaxe bei Unreifgeborenen, Deutsche med. Wchnschr. **55:** 1512 (Sept. 6) 1929.

21. Ulmer, O.: Die Anämieprophylaxe bei Unreifgeborenen, Arch. f. Kinderh. **89:** 272 (Feb. 28) 1930.

22. From the Sarah Morris Premature Department.

23. Robscheit-Robbins, F. S.: The Regeneration of Hemoglobin and Erythrocytes, Physiol. Rev. **9:** 688 (Oct.) 1929. Whipple, Robscheit-Robbins and Walden (footnote 7).

in cases of secondary anemia. Furthermore, they were able to demonstrate experimentally in dogs that it was obvious that the effect from oral administration of iron was more than a mere replacement in the lost or worn out hemoglobin molecule. They further state that "iron in excess of hemoglobin iron requirements obviously exerts some influence upon internal body metabolism," by producing more hemoglobin. This phenomenon they have termed a "salt effect," and it may occur similarly in the feeding of salt mixtures of copper and other metals and ash from liver and kidney.

Finally it has been found that by feeding liver and iron in combination a "summation effect" [24] was produced, the resulting increase in production of hemoglobin and red cells being the total effect of the organ feeding plus the original value due to iron administration alone.

Keefer and Yang [25] have reported that iron and liver given in combination to patients suffering with secondary anemia, especially in anemia due to hookworm infestation, showed improvement more effectively than when either liver or iron was given alone.

Hugh Josephs [26] has recently reported on the effect of feeding a number of premature infants iron alone, iron and copper and iron and liver in combination. He concludes that liver and iron in combination have apparently the most successful effect when used therapeutically after the physiologic premature anemia has developed.

Iron and Copper.—In the most recent literature there have been some experimental and clinical reports [27] on the use of iron in combination with copper employed therapeutically in secondary anemia. However, these results might be considered as the "salt effect" previously described. We have assumed that the "summation effect" of the liver-iron combination, plus the unknown influence of iron on internal metabolism, would be, theoretically at least, the most suitable for the prevention of physiologic premature anemia. Schiff and Joffe,[28] in a recent report of twelve cases, have demonstrated the failure of copper and copper and iron in combination to give prophylactic or therapeutic results in premature anemia.

In these experiments, therefore, we have not attempted the prophylactic use of the iron-copper combination, though it may still be tried out in a continuation of this work.

SUMMARY

In the prophylaxis of premature anemia it may be concluded that iron therapy alone is of doubtful value. Further, neither the use of desiccated hog's stomach (ventriculin) nor the use of liver fraction alone proved of value in the prevention of the anemia.

Favorable results seem to have been obtained in the prophylaxis of the anemia of premature infants through the use of a dried liver fraction combined with ferrous ammonium citrate.

The most marked results in this series of experiments were obtained in the group of premature infants, of from six to seven months' gestation, in which the development of the anemia was most severe. No definite conclusions as to the etiologic factors causing this anemia may be formulated from the experimental data which we obtained. In reviewing the literature, the following theories [29] for the cause of anemia of premature infants are most tenable: (*a*) the lack of an adequate iron reserve depot, and its early depletion; (*b*) a functional insufficiency of an imperfectly developed hematopoietic system.

The chief objection to the depleted iron reserve depot for explaining physiologic anemia of prematurity has been the fact that the prophylactic feeding of iron has not prevented the development of the anemia. Possibly the iron even though administered in large doses has been resorbed and retained only in minute quantities.

The functional incapacity of the hematopoietic system may be analogous to the incomplete and imperfect development of the gastro-intestinal, cardiovascular and heat regulating systems of the premature infant. At the sixth to the eighth month of intra-uterine life, the hematopoietic system is probably still somewhat imperfectly developed, and, therefore, functionally incapable of adequately responding to the additional demands of extra-uterine life.

This theory would help to explain the lower erythrocyte and hemoglobin values found in the premature infants of from six to seven months' gestation as compared to the premature infants of eight months' gestation. The exact mechanism of the development of this anemia still remains unexplained.

This is a preliminary report of an experimental attempt to prevent the development of the physiologic anemia of premature infants. The data obtained indicate that a combination of liver fraction and ferrous ammonium citrate, started within the first fourteen days after birth with initial dosages of from 1 to 2 Gm. twice daily, and increased up to 4 Gm. twice daily, was the most efficient of the prophylactic agents investigated. There was a definite response to this prophylactic agent, which was most marked in the series of premature infants of from six to seven months' gestation, in which group the anemia is most severely developed.

It is hoped that a continuation of this investigation with other mineral combinations or organic and mineral material in various percentages and dosages may yield further data on the prophylaxis of the anemia of prematurity.

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24. Robscheit-Robbins (footnote 23).
25. Keefer, C. S., and Yang, C. S.: The Value of Liver and Iron in the Treatment of Secondary Anemia, J. A. M. A. **93**: 575 (Aug. 24) 1929. Keefer, C. S.; Huang, K. K., and Yang, C. S.: Liver Extract, Liver Ash and Iron in the Treatment of Anemia, J. Clin. Investigation **9**: 533 (Dec.) 1930.
26. Josephs, H. W.: The Diagnosis and Treatment of the Anemias of Infancy, South. M. J. **23**: 1135 (Dec.) 1930.
27. Hart, E. B.; Steenbock, Harry: Waddell, J., and Elvehjem, C. A.: Iron in Nutrition: VII. Copper as a Supplement to Iron for Hemoglobin Building in the Rat, J. Biol. Chem. **77**: 797 (May) 1928. Lewis, M. S.: Iron and Copper in the Treatment of Anemia in Children, J. A. M. A. **96**: 1135 (April 4) 1931.
28. Schiff, E., and Joffe, N.: Kupferbehandlung des Frühgeburtenanämie, Klin. Wchnschr. **10**: 1946 (Oct. 17) 1931.
29. In a recent article, G. Sanpaolesi (Jahrb. f. Kinderh. **132**: 277 [Aug.] 1931) advances theoretical and experimental evidence in support of the theory that an increase in the fluid volume of the blood causes this premature anemia through dilution. According to the author, this hydremia mechanically lowers the erythrocyte count and the hemoglobin value.

Myasthenia Gravis.—Myasthenia gravis was first described by Wilkes in 1877. Since then about 300 cases have been reported and several excellent reviews have appeared. . . . The condition can probably be most briefly defined as a symptom complex characterized by sudden, intermittent and progressive clinical weakness of a muscle or muscle group, often terminating in death and leaving almost no pathologic changes despite the marked symptoms during life. No race is immune to this condition. According to Campbell and Bramwell, no case is on record in which more than one member of a family has been affected. Noyes, however, reported a sister and father of one patient to be similarly afflicted.—Abraham, S. V.: *Arch. Ophth.* **7**:700 (May) 1932.

THE SYMPTOMATOLOGY, DIAGNOSIS AND TREATMENT OF STRONGYLOIDES INFECTION

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The relatively frequent occurrence of Strongyloides infection throughout the southern part of the United States and the appearance of patients harboring this infection in clinics in the North call for more careful attention than has been given to this disease in the past. The larvae of the etiologic agent, Strongyloides stercoralis, were discovered in 1876 by Normand [1] in the stools of French soldiers who had contracted an uncontrollable diarrhea in Cochin China. At necropsy of five of these patients who succumbed to the diarrhea, delicate parasitic nematodes were recovered from the wall of the ileum and from the biliary and pancreatic ducts. Cases were soon diagnosed and studied by Grassi [2] and by Perroncito [3] in Italy. Leuckart [4] demonstrated that the parasitic and stercoral types in this infection belonged to alternate phases in the life cycle of the same organism, while Durme,[5] Ransom [6] and Fülleborn [7] proved that the filariform larvae of the worm invades man by the same route (i. e., by the skin) and migrates through the same organs and channels as the hookworm.

BIOLOGIC BACKGROUND

The female parasitic worms live in the mucosa of the small intestine, especially the duodenum and upper jejunum. In heavy infections the pyloric stomach wall, the common duct, the proximal biliary and pancreatic passages, the ileum, and even the cecum and colon may be involved. Aberrantly, adult worms and larvae may be recovered from practically all the organs and cavities of the body. Usually the eggs of the worm are laid in the intestinal mucosa, work their way out into the lumen, and are carried down the intestine, meanwhile maturing, so that they ordinarily hatch before being passed in the feces. Since the days of Leuckart, two types of development have been known, the direct and the indirect mode. In the former type, the hatched larvae (rhabditiform stage) are passed in the feces, feed ravenously on the excrement and metamorphose into filariform larvae, which, after casting their sheaths, are infective by way of the skin or the mucous membranes. Under favorable conditions of moisture and temperature the infective stage is able to survive for many weeks outside the body, although these larvae are much more sensitive to unfavorable conditions than is the similar stage of the hookworm. In the indirect type, which is much more common in the tropics than in cooler zones, the rhabditiform larvae, which are passed in the feces, feed and become transformed into "free-living" males and females, which mate and give rise to a daughter progeny of rhabditiform larvae. The latter feed and are changed into filariform larvae, which then and only then are infective for man. In the indirect type the development of the complete extrahuman phase of the life cycle takes place very rapidly (from two to five days) and the infective filariform larvae seldom live beyond the twelfth day following evacuation of the first-stage rhabditiform larvae in the stool.

While I was working in Panama during the summer of 1930, I [8] studied several cases of Strongyloides infection with symptoms of uncontrollable diarrhea and severe dehydration. The stools of these patients were teeming with dwarf filariform larvae. A study of the larvae showed that they had metamorphosed without feeding and that they developed no further. For a period of nine to twelve days they were infective through the skin and mucous membranes; otherwise they perished. Further investigation revealed the fact that in passing out of the intestine the infective filariform stage came in contact with the rectal mucosa and was able to penetrate through this membrane into the tissues, later passing through the blood stream into the lungs and out through the air passages into the pharynx and down into the intestine. This discovery explains the pathologic study of Ophüls [9] on a human necropsy and certain experimental observations of Fülleborn [10] and Nishigori.[11] This shortened mode of development to the infective stage I have designated the hyperinfective type.

PATHOLOGIC AND CLINICAL OBSERVATIONS

At the site of invasion through the skin there may develop in twenty-four hours a profound erythema, which becomes progressively more intense up to the fourth day, when lupous patches are observed. This is comparable to the "ground itch" of hookworm infection. From twenty-four to forty-eight hours after exposure to the infection, an acute local inflammatory reaction may take place in the lungs as the result of the migration of the larvae from the capillaries into the bronchioles. This condition has not been reported for hookworm infestation but parallels the bronchial pneumonitis observed in ascariasis when Ascaris larvae are migrating through the lungs. Later on, when the larvae have worked their way into the intestinal mucosa (frequently into Lieberkühn's glands) and have developed into the delicate coiled adult worms, they feed on the tissues and lay their eggs, which break through into the intestinal lumen. They provoke a catarrhal inflammation of the invaded mucosa, with round cell and eosinophil infiltration. The degree of these lesions is dependent on the number of embedded worms and the length of their activity. In severe cases there is extensive erosion of considerable areas of the pyloric, duodenal, jejunal and ileac mucosa, so that it has a raw beefsteak appearance. Where the large bowel is also involved, similar lesions occur. Usually there is no marked generalized eosinophilia but occasionally this is pronounced.

1. Normand, A.: Sur la maladie dite diarrhée de Cochinchine, Compt. rend. Acad. d. sc. **5**: 316-318, 1876.
2. Grassi, G. B.: Sovra l'anguillula intestinale, R. Inst. lomb. di sc. et lett., Rendic., Milan, series 2, **12**: 228-233, 1879.
3. Perroncito, E.: Die Krankheit der Bergmaenner (Kohlen und Minen-Arbeiter) von St. Gotthard zum Simplon, Centralbl. f. med. Wissensch. **24**: 1-31, 1881.
4. Leuckart, R.: Ueber die Lebensgeschichte der Anguillula stercoralis und deren Beziehungen zu der sog. Ang. intestinalis, Verhandl. k. Saechs. Ges. Wissensch., Leipzig **85**: 107, 1883.
5. van Durme, P.: Quelques notes sur les embryons de "Strongyloides intestinalis" et leur pénétration par la peau, Thompson Yates Lab., Liverpool **4**: 471-474, 1902.
6. Ransom, B. H.: The Nematode Parasites in the Alimentary Tract of Cattle, Sheep and Other Ruminants, U. S. Bur. Animal Industry **127**: 1-132, 1911.
7. Fülleborn, I.: Untersuchungen über den Infektionsweg bei Strongyloides und Ankylostoma und die Biologie dieser Parasiten, Arch. f. Schiffs.- u. Tropen.-Hyg., supp. **5**: 26-80, 1914.
8. Faust, E. C.: Human Strongyloidiasis in Panama, Am. J. Hyg. **14**: 203-211 (July) 1931.
9. Ophüls, William: A Fatal Case of Strongyloidosis in Man, with Autopsy: The Life Cycle of Strongyloides Intestinalis in Man, Arch. Path. **8**: 1-8 (July) 1929.
10. Fülleborn, F.: Hautquaddeln und "Autoinfektion" bei Strongyloides-Traeggern, Arch. f. Schiffs- und Tropen-Hyg. **30**: 721-732 (Dec.) 1926.
11. Nishigori, M.: The Factors Which Influence the External Development of Strongyloides Stercoralis and on Autoinfection with This Parasite, Taiwan Igakkai Zasshi, 1928, number 276, pp. 1-56 (Japanese text with English abstract).

In very light infections with Strongyloides there are frequently no demonstrable symptoms; in moderately heavy infections or those of long duration there is commonly a diarrhea following epigastric distress after meals, alternating at times with constipation; in severe infections (usually of the hyperinfective type) there is an intractable diarrhea, with macroscopic or occult blood, and undigested food. The faulty digestion and severe drain of liquids from the system produce emaciation of the most advanced type. Occasionally there is sufficient toxic absorption to induce profound toxic edema. Fortunately for physicians practicing in the United States, the latter type is not commonly observed except in cases from the tropics.

Diagnosis is based on finding the typical motile rhabditiform larvae in the stools. These can be most readily obtained by centrifugating a small sample of the stool previously comminuted in water and strained through cheese cloth. Strongyloides larvae require differentiation from the similar stage of the hookworm, which have a much longer pre-esophageal (pre-muscular) mouth cavity. Furthermore, in freshly passed stools the hookworm embryos are almost always within the unhatched eggs. In cases of severe diarrhea, unhatched eggs of Strongyloides occasionally are found. These should be left in the stools until they hatch, in order to obtain a satisfactory diagnosis, since the egg is very similar to that of the hookworm.

In the hyperinfective type the filariform larvae may be identified by their diminutive size and the minute terminal notch in their tail. Occasionally parasitic females and males are passed in diarrheic stools. The former are delicate threads just visible to the naked eye and contain eggs in a bicornate uterus. The rare parasitic males are practically indistinguishable from the "free-living" males of the indirect cycle.

THERAPEUSIS

Until 1928 there was no specific treatment for strongyloidosis. In that year DeLangen[12] in Java indicated the efficacy of gentian violet in reducing the toxic effect of the parasite in severe cases and in some instances causing eradication of the worms. In 1929 I[13] used this agent for the first time in the United States. At least 200 cases (about 6 per cent infection in the New Orleans Charity and Welfare clinics) have on my recommendation been treated by New Orleans physicians with gentian violet. Of this number I have made follow-up examinations of forty-seven patients and all but two have been freed of the infection. In most cases a single course of treatment was sufficient to eradicate the worms. This consisted of two one-half grain (0.03 Gm.) enteric coated tablets of the dye (National Aniline and Chemical Company product) administered by mouth three times a day before meals for a period of from seven to ten days. In four cases, two courses of treatment were needed. There is no contraindication to administering the drug but patients have been cautioned to report if the urine was ever violet colored. Up till now no such report has been received. Two patients reported mild nausea, but there was no similar complaint from the others. The dye operates by staining the mucosa of the intestine a brilliant violet (undoubtedly a vital cytoplasmic reaction). The adult parasitic worms living in the mucosa absorb the dye and are very susceptible to its toxic effect, become free from the mucosa, and may be passed in the feces. Any portion of the dye that is absorbed beyond the intestinal mucosa is soon reduced to a colorless substance. Strangely enough the eggs and young larvae are not readily killed. Furthermore, small amounts of the dye modify the indirect and hyperinfective type into the direct type, thus minimizing the danger of the infection before the parasites are actually killed.

12. DeLangen, C. D.: Anguillulosis and the Syndrome of the "Idiopathic Hypereosinophilia," Neded. van d. Dienst d. Volksgezondheid in Ned.-Indie, Batavia, 1928.
13. Faust, E. C.: Gentian Violet Therapy for Strongyloides Infection, editorial, Internat. M. Digest 17: 57-58, 1930.

CONCLUSIONS

Physicians in the South are more or less familiar with Strongyloides infection. Owing to previous inability to eradicate the worms, the patients treated have returned time after time or have gone to other physicians for help. It is recognized that Strongyloides infection is not always the cause of intestinal symptoms which have been referred to it, but in many cases eradication greatly improves the condition and at least allows the physician to eliminate the organisms as a possible causative factor in the symptomatic complex. In severe infections the clinical picture is so clear that, once the relationship is known, there is no difficulty in associating cause and effect. It is believed that the time is ripe for a more intensive study of Strongyloides infection on the part of both the internist and the laboratorian.

1430 Tulane Avenue.

TREATMENT OF AGRANULOCYTIC ANGINA WITH CALCIUM GLUCONATE

REPORT OF CASE, WITH AUTOPSY

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AND
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Cases of agranulocytic angina are of interest because of its unknown etiology, its high mortality rate and the lack of knowledge of any specific treatment. It is even doubted whether the condition is a syndrome or a distinct clinical entity. The following fatal case was interesting because the patient was an allergic individual, and because an improvement in the blood picture was noted following the administration of calcium gluconate:

REPORT OF CASE

A woman, aged 44, married, was treated at the Santa Barbara Cottage Hospital between Sept. 7 and Oct. 10, 1931, for obesity and hypertension, both of which had been present for fourteen years. She also complained of symptoms referable to the menopause, of several months' duration.

During the preceding twelve years she had undergone a cesarean operation, cholecystectomy and appendectomy, and a pad of fat had been removed from the abdomen. For four years she had experienced allergic symptoms whenever she ate pineapple. Red and white blood examinations with differential counts were normal in August, 1917, and in February, 1930, the red and white blood counts were again normal. The family history was negative except that the patient's mother had diabetes.

Physical examination disclosed an enlarged heart, myocardial degeneration and marked obesity. Varicose veins were present on both lower extremities. Roentgenograms of the skull showed a thick, irregular, very dense calcified deposit on the inner aspect of the frontal bones and on each side of the sagittal

From the Sansum Clinic.

suture. In the mouth, situated in the midline of the hard palate, was an exostosis measuring 1 by 1.5 by 2.5 cm. Several teeth were devitalized. The tonsils had been removed.

Gastric analysis, red and white blood counts, and examination of the stool revealed nothing noteworthy. The blood Wassermann reaction was negative. Traces of albumin and sugar were found in the urine; the excretion of phenolsulphonphthalein was 57 per cent in two hours.

The patient was hospitalized on an alkaline 800 calory reducing diet. During the ensuing month the blood pressure fluctuated between 152/100 and 224/136. By October 8 she had lost 10 pounds (4.5 Kg.), the headache was less severe, and the heart diameter had decreased 1 cm. by orthodiagram measurement. She was able to be up and her gait had improved.

October 10, she was discharged. Following an automobile drive that afternoon her throat became sore and the next morning when she planned to leave for her home the temperature was 101.4 F. She was kept in bed and treated for an infection of the upper respiratory tract. The next day the temperature was 103.6 and a blood count showed 1,200 leukocytes and only 43 cells on a smear, all of which were lymphocytes. The agranulocytosis persisted during the next eight

Necrotic tissue from mouth, removed October 15, reduced from a photomicrograph with a magnification of 100 diameters. There is marked vacuolization. An occasional round cell is visible. No polymorphonuclear leukocytes are present. A number of circumscribed oval or circular areas may be noted, up to 100 microns in diameter, consisting of finely granular blue material as if from deposits of calcium.

days, as shown in the accompanying table. There was septic temperature, the highest point each day varying between 103.6 and 105.2. October 13 she complained of headache, soreness of the throat and neck, pain through all the teeth, soreness and stuffiness of the ears, and aching in the joints. The blood pressure had fallen to 140 systolic and 90 diastolic. On the posterior wall of the nasopharynx and in the hypopharynx at the left margin of the tongue were several small white ulcers, varying from 1 to 2 mm. in diameter. In the middle of the left tonsil fossa was another. The mucous membrane of the pharynx and of the gums on the right was moderately reddened. In the neck a few enlarged very tender lymph nodes were palpated.

October 15 the throat, teeth and gums were very sore, but the generalized aching had subsided. The icteric index was 11. There was moderate edema of the mucous membrane of the pharynx and gums. The ulcers were twice as large, and several new ones had appeared on the gums and pillars of the palate.

October 16, the patient complained of soreness about the urinary meatus, but vaginal and rectal examinations were negative. There was a sensitive area in the upper right chest over the third rib. In the mouth there was considerable membrane formation over all the gingival surfaces. This was white, was of a soft though tough consistency, and was raised above the surface level of the surrounding mucosa. It peeled off readily, leaving a nonbleeding surface with very little evidence of inflammatory reaction. There was moderate edema

Differential Count

	Oct. 12-19, Inclusive	Oct. 20	Oct. 21
Leukocytes, per cubic millimeter	756-1,300	1,700	7,500
	Percentage		
Lymphocytes (small)	100	73	41
Lymphocytes (large)	...	18	1
Lymphoblasts	...	..	4
Monocytes	...	3	2
Monocytes (large)	...	2	0
Megakaryocytes	...	2	0
Neutrophilic myelocytes	...	0	45
Polymorphonuclear neutrophils	...	2	7

of the arytenoids, and the white membrane of the left pillar of the palate had begun to peel off. The cervical lymph nodes were smaller and less tender. The skin had a dull icteric tint; the breath was fetid, and in the mouth the necrotic areas and superficial sloughing were more extensive, involving almost all the gum surfaces, the whole left posterior pillar of the palate and an area on the mucous membrane of the right hard palate which measured 1.5 by 2 cm. Treatment with calcium gluconate was started October 16, 1 Gm. in 10 cc. of solution being given intravenously each day for four doses.

October 19, a mild degree of stupor was noticeable. The respiratory rate was 40 per minute. Numerous râles were audible over the lower right chest, but there was no evidence of consolidation. October 20, five days after treatment with calcium gluconate had been started, the first improvement in the blood picture was noted and the temperature was lower (102). The change in the condition of the blood suggested that, if death could be postponed a few days more, recovery might take place. On the following day the blood picture had improved still more, but the patient was moribund. The pulse was thready and the rate was 108 per minute. Blood pressure was 110 systolic and 86 diastolic. Examination of the chest suggested hypostatic pneumonia and bronchopneumonia. The abdomen was moderately distended and the test of the stool was strongly positive for blood. Death occurred early on October 22.

At autopsy the cranial contents were not examined. The ribs were found to be very brittle and porous; there was a moderate hypostatic hyperemia of the lungs, a subacute bronchitis and tracheitis, marked fatty change of the liver and kidneys, moderate hyperplasia of the spleen, moderate fatty changes of the lining of the aorta, and moderate ascites. A section from the sternum was decalcified, fixed and examined. There was almost a complete absence of pregranulocytic elements. The centers for red cell formation seemed normal.

In smears from the lesions in the mouth, October 13 and October 15, gram-negative and gram-positive cocci and gram-negative rods were found. In cultures from the throat, October 13, gram-positive diplococci were grown. Cultures of the blood, October 13, yielded staphylococci; October 15, long chained streptococci; October 16 and October 19, Bacillus coli. The patient's blood, October 15, was injected intraperitoneally into two guinea-pigs but after a month's time had had no bad effect on them.

COMMENT

This was evidently a true agranulocytic angina. Cultures from the blood yielded a variety of organisms. The sensitivity to pineapple suggests that, as has been noted by Pepper,[1] allergy may be of etiologic significance. Of interest were the calcified deposits on the frontal bones, an exostosis of the hard palate and calcium-like deposits in the sloughs from the mouth, all

1. Pepper, O. H. P.: Leukopenia: A Review with Special Reference to Agranulocytic Angina: Part II, California & West. Med. **35**: 173-177 (Sept.) 1931.

of which suggested disturbance of the calcium metabolism. The appearance in the blood of granulocytes on the fifth day following the administration of calcium gluconate suggests that this agent may be of therapeutic value. Its use was suggested by the work of Tunnicliff,[2] who has demonstrated, following its administration to rabbits and to a man, an increased phagocytosis by leukocytes in the blood.

Clinical Notes, Suggestions and New Instruments

HEALING OF COCCIDIOIDAL GRANULOMA LESION FOLLOWING MEDICINAL THERAPY

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The reports of results of medicinal therapy in cases of coccidioidal granuloma have been disappointing. Because of the effect of iodides in other fungous diseases, probably the method most extensively used in the earlier cases was the internal administration of iodides. The results were not striking. Recently Chipman and Templeton[1] reported improvement under oral and intravenous iodide therapy but failed to obtain healing. Their results with antimony and potassium tartrate (tartar emetic) were disappointing, although its use seemed wise following the reports of Guy and Jacob[2] and of Tomlinson and Bancroft.[3] The latter investivators use local roentgen therapy as well as antimony and potassium tartrate intravenously, so that it is entirely impossible to assign therapeutic values properly, particularly since x-rays have been accorded beneficial effects by earlier workers. Chemotherapy in the form of copper, arsenic or thymol has been disappointing in its results.[4] Coccidioidin has not been proved to possess merit.

A goodly percentage of the few cured cases on record must be attributed to radical surgical removal of the offending lesion or lesions. Unfortunately, the majority of cases are not suitable for this method of treatment. The disease is ordinarily so disseminated that curative medicinal means must be sought, or the disease will continue to present a rather hopeless outlook.

Perhaps it would be well to establish an arbitrary time period within which no case can reasonably be considered cured, at the same time recognizing that cases may exceed such a period and then exhibit a recurrence or extension of the process. That such a time period has been of considerable help in evaluating forms of therapy, in cases of malignant disease, will scarcely be denied. In twenty-seven of the fifty cases of coccidioidal granuloma studied by Evans and Ball,[5] in which the total duration of the disease was known, an average duration of nine and one fourth months was obtained, the longest time being sixty-two and one half months. Beck[6] records a case of generalized infection lasting seven years and terminating fatally. It would seem that a period of two years should elapse during which time no clinical manifestations of the disease are evident, before a case can reasonably be considered cured.

The case to be reported was submitted to a method of attack previously untried. Fortunately, we were dealing with a single lesion, but in a situation not amenable to surgical eradication. Surgical procedures were carried out on two occasions with no apparent benefit, with the possible exception that they prepared the lesion for a more direct attack with medicinal agents.

That many fungous diseases are cured by iodide therapy is a well known fact. That coccidioidal granuloma has not so responded to iodide therapy does not mean that the organisms may not be susceptible to iodides, but only that they are not susceptible to the concentrations attained by the forms of administration ordinarily employed, chiefly oral.

It was decided in the present case to attempt to secure a higher concentration of iodine and iodides in the vicinity of the lesion. Because of the relative insolubility of iodine in water, and the irritating nature of an alcoholic solution to an open wound, it was decided to prepare a solution of 5 per cent potassium iodide, which was then saturated with iodide crystals. On assay, this solution was found to contain 39.6 Gm. of free molecular iodine per hundred cubic centimeters of solution at room temperature. This falls just short of being a 40 per cent solution of iodine.

This was applied in the form of continuous or intermittent wet dressings, with surprisingly little irritation, and sodium iodide was administered by mouth in doses of 25 minims (1.5 cc.) three times daily.

The rapidity with which the granulations melted away was remarkable. Roentgen examination revealed a filling in of bone in an area previously shown to be partially destroyed. The skin showed a wide zone of erythema, which was assumed to indicate the extent of the iodine absorption. From this point healing was slow, and this was later attributed to the strength of the iodine solution because, after withdrawal of the local applications, healing occurred more rapidly. The time consumed

Fig. 1.—Appearance of lesion, July 11, 1931, before applications of iodine. Culture was positive at this time.

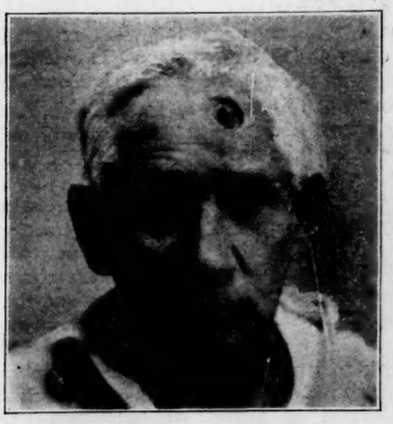

Fig. 2.—Appearance, Nov. 3, 1931, after three and one-half months of iodine application.

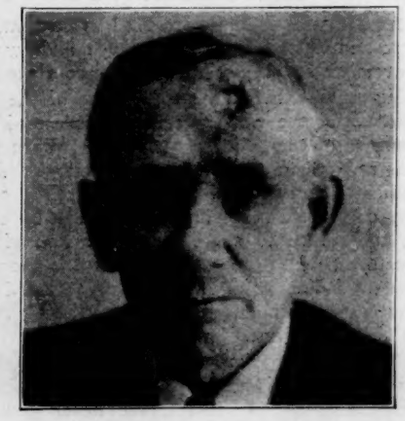

Fig. 3.—Complete healing, Jan. 15, 1932. Note depression due to absence of frontal bone in this area.

2. Tunnicliff, Ruth: Promotion of Phagocytosis by Calcium Gluconate, Sodium Iodide, Dextrose and Other Substances, J. Infect. Dis. **48**: 161-166 (Feb.) 1931.

From the Department of Pathology, College of Medical Evangelists and the Pathology Laboratory of the San Diego County General Hospital.

1. Chipman, E. D., and Templeton, H. J.: Coccidioidal Granuloma, Arch. Dermat. & Syph. **21**: 259 (Feb.) 1930.
2. Guy, W. H., and Jacob, F. M.: Granuloma Coccidioides, Arch. Dermat. & Syph. **16**: 308 (Sept.) 1927.
3. Tomlinson, C. C., and Bancroft, Paul: Granuloma Coccidioides, J. A. M. A. **91**: 947 (Sept. 29) 1928.
4. Dickson, E. L.: California Dept. of Pub. Health, special bull. 57, 1931, p. 8. Stockton, A. B.: California & West. Med. **31**: 278, 1929.
5. Evans, Newton; and Ball, H. A.: Coccidioidal Granuloma, J. A. M. A. **93**: 1881 (Dec. 14) 1929.
6. Beck, D.: California Dept. of Pub. Health, Special bull. 57, 1931, p. 19.

in this form of treatment was approximately six months, when complete healing of the lesion occurred.

The apparent success attending the treatment of this case would seem to warrant its trial in other cases. The incision of cold abscesses and irrigation of the cavities with such a solution are suggested, though, with such a strong solution of iodine, toxic effects must be anticipated. Other methods of application will suggest themselves.

REPORT OF CASE

J. F., a white man, aged 66, an elevator operator, was ill with "pneumonia" in December, 1930. In January, 1931, he noticed what he thought was going to be "a pimple" high on his forehead within the hair line. This was painless and very gradually increased in size during the next few months, when he consulted a physician because it interferred with the satisfactory wearing of a hat. A roentgenogram of the skull showed a destructive lesion in the frontal bone.

Incision of the swelling and curetting of the bone were done, May 10, by Dr. W. J. Ryan. Dr. E. H. Ruediger of the Mercy Hospital rendered a diagnosis of coccidioidal granuloma, from histologic examination of tissue removed at operation.

The lesion drained considerably, and a roentgenogram of the area taken early in June showed an extension of the process in the frontal bone. The bone was again curetted, June 14, and a rubber drainage tube placed. Five days following the second operation, the patient entered the San Diego County General Hospital.

The tube was removed and the wound rapidly filled with granulation tissue. A positive culture of Coccidioides immitis was obtained from the exudate. The appearance, July 11, 1931, is shown in figure 1. The method of attack as outlined was decided on and was actively begun on this date. Saturated solution of sodium iodide was given by mouth in 15 minim (1 cc.) doses three times a day. This was increased to 25 minims and was administered throughout his stay in the hospital (four months). Local applications of potassium iodide (5 per cent) saturated with iodine were used as continuous wet dressings at first and, later, applications three and two times a day until November 3, when it was first discontinued.

Figure 2 exhibits the appearance of the wound at this time. Healing of the wound occurred more rapidly after the discontinuance of the iodine applications. When the size of the ulcer was reduced to a diameter of 2 cm. and while 1 per cent copper sulphate dressings were being applied, several small ulcers occurred in the new skin over the healed area, suggestive enough in appearance to cause the resumption of the external iodine treatment. A prompt healing of the ulcers occurred. Intermittent iodine applications were continued and the lesion was finally healed completely, Jan. 15, 1932 (fig. 3) and has remained so since that time.

The patient has returned to work and feels perfectly well. At no time was his general physical condition impaired. Roentgenograms of the chest have never demonstrated an active pathologic process.

COMMENT

It would seem justifiable to conclude that Coccidioides immitis is probably sensitive to iodide therapy provided the concentration of iodine is sufficiently great in the vicinity of the organisms, and in this respect it is only quantitatively different from other pathogenic fungi.

The recurrence, while under copper sulphate dressings, of ulcerating lesions in areas previously healed, would tend to throw some doubt on the efficacy of copper or its sulphate in the control of this condition. This is in harmony with unpublished observations I have made on the effects of copper treatment in these cases.

The results in this case would seem to warrant a therapeutic trial in other suitable cases.

A period of two years must elapse, free from evidence of active disease, before I shall consider this case as probably cured.

The unified method of treatment with iodine and iodides makes no other conclusion possible than that they are therapeutically potent agents in this disease.

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ASTHMA FROM FOOD ODORS

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The ingestion of various foods as a frequent specific cause of asthma has been well known for many years. It is less known, however, that some of these foods give off volatile substances, especially during the process of cooking, that are capable of arousing attacks of asthma. The literature contains rather meager references to this subject. In Coca's recent book the following statement is pertinent: "Although fish usually acts as an ingestant, it is not uncommon to find that the mere odor of it in the room, particularly when it is being cooked, may induce asthma in the markedly sensitive child."

The following cases are illustrative:

CASE 1.—E. W., a white woman, aged 43, seen by us, Dec. 4, 1928, complained of attacks of cough and dyspnea occurring during the past six months. These spells usually came on about 1:30 p. m. on Tuesdays and Fridays. The patient worked at a cafeteria and thought that the odor of scalding shrimps was responsible for the attacks. On further inquiry it was found that it is the custom at this cafeteria to cook shrimps on the days mentioned. The presence of shrimps after they were cooked did not upset her. She had never eaten shrimps. She had a sister who had asthma.

The patient was well nourished. Examination of the chest gave results that were within normal. The blood showed: hemoglobin, 85 per cent; erythrocytes, 3,770,000; leukocytes, 4,500, and no eosinophils. Roentgen examination of the chest was essentially negative. The urine and sputum were normal. The basal metabolic rate was —6 per cent. Cutaneous tests with all available protein extracts were negative, except with the extract of shrimp. The latter gave a ++ reaction (moderate size wheal with erythema and itching) on three different trials.

Feb. 9, 1929, the patient reported that shrimps were being cooked in the basement and that she had no trouble. A follow-up report, Feb. 7, 1932, showed that she had had no asthma in over three years, since she was careful to keep away from the room where shrimps were prepared.

CASE 2.—C. F., a girl, aged 6 years, seen by us in September, 1930, had suffered frequently from asthma attacks since the age of 2. Many attacks were of a severe nature, lasting from seven to ten days. A cough persisted between these attacks. At times asthma was associated with an infection of the upper respiratory tract. The family history was negative for allergy. During infancy the child had had eczema and chickenpox. The tonsils were removed at the age of 5, after which the attacks of asthma and the respiratory infections were less frequent.

Examination showed slight underweight, and the presence of wheezing râles and dyspnea during an attack. No other abnormalities were noted. The urine and stool were normal. The Pirquet and Schick tests were negative. Cutaneous tests gave strongly positive reactions to pea, bean, lentil, almond and cocoa. There were moderate reactions to string bean, kidney bean, squash, oyster, butternut, peanut, fig, plum and cottonseed.

By elimination it was soon found that peas, beans and lentils were the foods responsible for the attacks. Paroxysms of asthma and urticaria followed the deliberate ingestion of these foods. After they had been eliminated from the diet the parents observed that the child would get an attack of asthma whenever peas, beans or lentils were being cooked in the home. Further cooking of these vegetables was stopped and care was taken to keep the child away from other homes where there was a possibility of exposure to these odors. Under this management there have been no attacks in the last seventeen months.

CASE 3.—S. L., an Italian woman, aged 46, seen by us in February, 1930, had had asthma for eight years. The attacks, which had at first lasted only two or three hours, now were a few days in length. She thought that the attacks were precipitated by colds. The past history was insignificant and there was no family history of allergy.

The patient was well nourished. There were wheezing and sonorous râles. No other noteworthy physical observations were obtained. A roentgenogram of the chest showed no

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changes. The electrocardiogram showed a slurring of the QRS deflections and some left axis deviation. Skin tests resulted in very marked positive reactions to bean, kidney bean, string bean, pea, black-eyed pea and lentil. There was less marked reaction to hazelnut, fig and wheat globulin.

Following the skin tests the patient gave the information that she could distinctly associate the eating of beans and peas with attacks of asthma. These seizures come on about half an hour after ingestion. She also stated that if she cooked any peas or beans the odor from these gave her an attack within half an hour. If she visited her mother-in-law when any of these vegetables were being cooked, an attack ensued. Lately she had persuaded her mother-in-law to cease cooking peas and beans.

Intradermal tests with extract of peas gave a definite reaction with as high a dilution as 1 : 10,000,000 but failed to react with 1 : 100,000,000. A passive transfer with the patient's serum to the skin of a nonsensitive individual was made. Two days later the sensitized site gave a positive reaction with intradermal injection of pea extract up to 1 : 10,000 dilution. To demonstrate further the volatile nature of the reacting substance, the following experiment was made: A flat dish containing 15 cc. of Coca solution was exposed for half an hour at a distance of 30 inches from dried peas cooking in a pot. Another dish of Coca solution was exposed at a distance of 5 feet from the cooking peas. Both solutions were filtered through Berkefeld filters and tested intradermally on the patient. The first gave a definite reaction, the second a faint reaction. Controls with Coca solution and a solution exposed to other cooking vegetables to which the patient was not sensitive gave negative reactions.

COMMENT

The cases reported are instances of sensitiveness to volatile substances given off by food (cooking). We have similar cases in which the reaction consists of a rhinitis. It is suggested that this etiologic factor in asthma and other allergic conditions may be more frequent than we realize since in the majority of instances the association of the attack with a specific substance is not apparent to the patient. We realize that the rather common complaint of many individuals that certain odors produce certain undesirable reactions may be in the main psychogenic. We contend, however, that in some it may be actually on an allergic basis. It will be advisable in the future in the case of sensitiveness to food substances not to be entirely content with the elimination of the food from the patient's diet. It is possible that attention to the likelihood of food odors as factors in sensitization may clear up some of the food-sensitive cases that have not responded to ordinary food elimination.

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BULLETS IN THE EAR: REPORT OF THREE CASES

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Judging from reports in the literature, one observer seldom has the opportunity to compare the effects, in different patients, of bullets in the middle ear. Three such cases are reported, and briefly compared, in this paper.

REPORT OF CASES

CASE 1.—A woman, aged 36, came to the Mayo Clinic because of obesity and discharging ears. When the patient was 16 years old and living in Italy, she became infatuated with a youth of 18 years. They decided to get married, but the parents of both objected strenuously. The young people, much disheartened, went into the woods, where they spent the day. Evening came, but home was an undesirable place, and the young woman did not deem it proper to remain in the woods all night with a young man to whom she was not married.

After much consultation, they decided to shoot themselves, reasoning that the most vulnerable spot was the ear. The young man had a small, 0.22 caliber revolver, and two cartridges. He shot the young woman in the right ear, holding the revolver close to the head. She dropped to her knees, but was soon on her feet again, maintaining that she was far from dead. They had not foreseen this, and the question arose as to who was to get the second bullet. The young man decided this easily and shot the young lady in the other ear. Again she dropped to the ground. When he saw she was bleeding from both ears and yet very much alive he became frantic, and rushed back to town, where he drank large drafts of kerosene. Thinking that he was about to die, he told of the experience in the woods. A stomach tube was used and the kerosene removed. The young woman was brought in from the woods. The man was put in jail. When the parents saw that six months' incarceration did not lessen the infatuation of the young people, they relented and had the young man released from prison on the promise that he would marry the young woman and that both would go to the United States. They did this.

The patient was first seen in the Section on Otolaryngology in June, 1927, twenty years after the shooting. She gave the stated history and said that she had had a discharge from the left ear continuously, and from the right ear almost continuously. On seven or eight occasions, the discharge from the right side stopped. This was accompanied by much pain and fever. Hot packs were used. After the discharge had been reestablished, the pain and fever subsided.

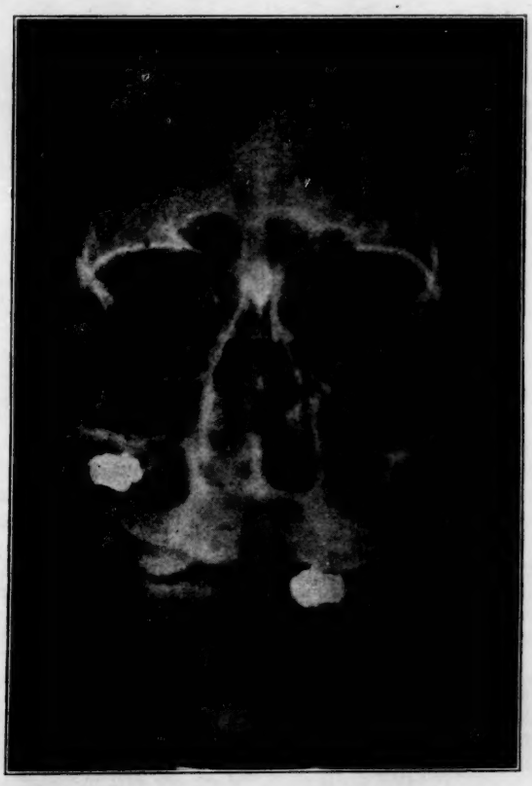

Fig. 1.—Bullets in the right middle ear and in the left upper cervical portion of the spine.

Examination disclosed that the drum of the left ear was destroyed and that there was a thick, mucopurulent discharge. The patient could hear a medium whisper in this ear. Examination of the right ear disclosed that the drum was destroyed and that there was granulation tissue and foul pus in the middle ear. The patient could hear a loud voice ad concham in this ear. The stereoroentgenograms gave evidence that the bullet was in the middle ear on the right side and in the region of the cervical portion of the spinal column on the left. A radical mastoid operation on the right ear was advised and consented to. At the operation, the bullet was found in the middle ear and was removed with some difficulty. The anterior wall of the canal was deficient. There was apparently no injury to the inner wall of the middle ear, and at no time either before or after the operation was there facial weakness or labyrinthine irritation. The typical radical mastoid operation was done.

Convalescence was uneventful. A good cavity was obtained, and hearing improved until a medium whisper could be heard ad concham. The condition of the left ear cleared up under treatment.

From the Section on Otolaryngology, the Mayo Clinic.

CASE 2.—A man, aged 29 years, presented himself because of right facial paralysis and deafness in the right ear. Three months before he came to the clinic, he had been shot with a 0.22 caliber bullet, fired at a distance of 40 feet. The bullet entered his head at a point 1 inch in front of the right ear. He did not lose consciousness. The injury was immediately followed by right facial paralysis and profound deafness in the right ear. He had been operated on elsewhere shortly after

Fig. 2.—Bullet in the right middle ear.

the accident, in an effort to remove the bullet, but this operation had been unsuccessful.

On examination of the right ear when he came to the clinic, landmarks were obliterated, and a note was made that there was something hard behind the drum, or something crowding the drum from above. A roentgenogram gave evidence that the bullet was in the middle ear. The mere presence of the bullet was giving no symptoms, and it was deemed advisable to disregard it for the time being. However, in an attempt to correct the facial paralysis, end-to-end anastomosis between the proximal portion of the spinal accessory and the distal end of the facial nerves was made. The final results of this operation were determined later, as will be explained.

Fig. 3. — Deformed bullet removed from mastoid. The illustration is about one-fourth larger than the bullet, which weighed 76 grains.

Five years after the accident, the patient began to have pain in the right ear and a foul discharge from it. The condition did not respond to the treatment given it, so he returned to the clinic and a radical mastoid operation was performed. The bullet was found in the posterior inferior portion of the middle ear. Because of the erosion, it was thought best to open the labyrinth after the method of Hinsburg. Convalescence was uneventful. Function of the facial nerve had returned to a considerable extent.

CASE 3.—A woman, aged 26, came to the clinic because of pain in the right ear and mastoid. She gave a history of having been shot nine years previously, just below the right nostril. There had been bleeding from the right ear, but with irrigations this had cleared up in one month. No effort had been made to find the bullet.

There had been no further symptoms until six months before the patient presented herself for examination. At that time she complained of sharp pains in the head and neck. Her dentist had removed some teeth, but only a few days' relief had been afforded. The ear then had commenced to discharge and the pain had increased. On her arrival at the clinic, her temperature was 101 F. and codeine was necessary to relieve the pain.

Examination revealed a very narrow canal, a thin discharge, under pressure, and tenderness present. Roentgenograms indicated that the bullet was in the middle ear.

A radical mastoidectomy was performed. The bullet was found at the inner end of the external canal and partly in the middle ear. The inferior wall of the canal was eroded. There was a large cholesteatoma in the middle ear and attic. The bullet, together with the cholesteatoma, was removed. There had been no injury to the facial nerve or semicircular canals. The patient still retained some hearing. Convalescence was uneventful.

COMMENT

In case 1, the foreign body caused a discharge almost immediately and gave more or less trouble all the time. In case 2, the middle ear tolerated the bullet five years before a discharge was set up. In case 3, more than eight years elapsed before the foreign body commenced to give trouble.

Special Article

VITAMIN B_1 IN RELATION TO THE CLINIC

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[EDITORIAL NOTE.—The following article is one of a series on the Present Status of the Knowledge of Vitamins, prepared under the auspices of a committee composed of Morris Fishbein, chairman, Lafayette B. Mendel and Julius Hess, representing a joint committee of the Council on Pharmacy and Chemistry and the Committee on Foods. These articles have been considered by the Council on Pharmacy and Chemistry and by the Committee on Foods and are published under their auspices. The opinions expressed are those of the authors and not necessarily the opinions of the Council on Pharmacy and Chemistry or the Committee on Foods.]

When considering the application in the clinic of the experimental work of physiologists concerning the antineuritic vitamin, it is advantageous to distinguish between the state of extreme deficiency of this accessory food factor as contrasted with that in which there is only a moderate shortage of this vitamin. Beriberi may be taken as the prime illustration of the former condition; its syndrome is quite well defined, a fact that is of great aid to an accurate diagnosis. Quite a different state of affairs characterizes a moderate lack of antineuritic vitamin. In such cases the picture is not clear-cut but rather confused, and in consequence of this there may be considerable difference of opinion regarding the significance or even the existence of various alleged features of the syndrome. Obviously, then, progress in this field must necessarily be slow, and every step forward must be taken with proper scientific caution; the need for preservation of an open-minded attitude with respect to developments in this field of activity is very great.

Many of the efforts now being directed toward clinical application of the facts discovered concerning vitamin B_1 are essentially preventive in nature rather than curative. It is not an exaggeration to say that the greatest advance that can now be made with respect to conquering beriberi lies not in the treatment and cure of this condition, for these problems have really been solved, but in the development of some plan by which governmental and social forces can be brought to bear on the prevention of beriberi in those parts of the world where this disease is a veritable scourge. From

time to time, students of this problem have suggested measures aimed chiefly at reducing the consumption of polished rice in the Far East, where beriberi is endemic.[1] Numerous animal tests have been made in an endeavor to arrive at some fairly simple standard of rice composition that might be useful in framing laws aimed at curbing the traffic in too highly polished rice.[2] If any really satisfactory plan could be devised that would accomplish a marked reduction in the use of white rice and an increased consumption of certain other foods in the face of the poverty and ignorance that prevail among the masses of the Far East, this discovery would, in my opinion, be one of the first order in its value to mankind.

Similarly, the problem presented by a moderate shortage of antineuritic vitamin is to a considerable extent one of preventive medicine. Two schools of thought have contributed to the discussion of this problem. Some clinicians[3] maintain that the possibility of vitamin B_1 deficiency occurring to any appreciable extent under the conditions of dietary habits and regimens prevailing in the United States has been greatly exaggerated; these clinicians insist that mere regulation of the diet, substitution of vegetables and fruits for much of the highly milled components of the American dietary, suffices as a therapeutic measure and that it is not necessary to use special concentrates of vitamin B in the clinic except perhaps in manifest beriberi. This attitude toward the problem is easily understood when one appreciates the paucity, until recently, of suitable clear-cut clinical evidences of the need for antineuritic vitamin, except in cases of obviously extreme deficiency, such as is seen in beriberi.

In contrast to this view, one may cite the position of the clinician who realizes that (1) the law of the minimum is involved in the preservation of the healthy nutritive state, (2) because of faulty gastro-enteric function there may be a failure to utilize a large enough fraction of the vitamin ingested, (3) because of obstructive conditions there may be great difficulty in taking sufficient nourishment by mouth and a condition of vitamin deficiency may result, (4) the period of vitamin shortage which an individual may safely endure is variable, being influenced by several factors, and (5) in cases of doubt with respect to a shortage of vitamin B playing a rôle the test is simple and harmless and consists not merely in regulating the diet—a therapeutic measure that exerts its beneficial effect slowly—but in administering large amounts of the missing factor immediately and thus securing a prompt answer to the question.

Much of the disagreement among clinicians with respect to the importance of vitamin B is doubtless due to failure to appreciate the fact that many of the studies conducted on animals are not quite comparable to those made on man. The investigator working with animals endeavors as far as possible to limit the variables operating in his experiments. The success which attends his efforts in this regard determines to a very large extent how precisely he may state his conclusions and how convincingly he may demonstrate cause and effect relations. In the case of observations to be made on human beings, however, the problem of suitable experimentation is a much more difficult one. A dietary deficiency in a human being is much more likely to be a complicated condition. It is not to be presumed that many persons live on precisely the same diet as, for example, a group of rats used in a nutritional investigation. In all probability the "wet" and the "dry" types of beriberi represent essentially the same deficiency disease with different complications. It is well known that a nutritional edema may be produced experimentally by feeding diets low in protein over extended periods until the concentration of blood plasma proteins falls to an abnormally low level. It is quite possible, although by no means proved as yet, that the edema of "wet" beriberi is due to a shortage of protein and is therefore evidence of a multiple deficiency.

It is obvious that when clear-cut results are obtained in suitably controlled animal experiments, they deserve very careful consideration. Each suggestion from this field of endeavor should be given suitable clinical trial, and final judgment as to the significance of animal experiments to the clinic should be reserved until the results of clinical tests are at hand. For the correct evaluation of the researches there should be cooperation of the physiologist with the clinician.

BERIBERI: A CONDITION OF EXTREME VITAMIN B_1 DEFICIENCY

Definition and Etiology.—"Beriberi is an acute or chronic disease characterized by changes in the nervous system and particularly by a multiple peripheral neuritis with an especial tendency to attack the nerves of the limbs, the pneumogastrics and phrenics. Ordinarily the clinical picture of a peripheral neuritis is combined in varying degrees with cardiac disturbances, edema, serous effusions and gastro-intestinal derangements. Exceptional cases occur in which cardiac dilatation and sudden death are the first symptoms observed."[4] The early work and ideas concerning the etiology of this disease are admirably presented in Vedder's monograph. The points of view that have been expressed with respect to the origin of beriberi may be summarized briefly as follows: (1) The disease is essentially an intoxication, (2) it is an infection, and (3) it is due to lack of an essential dietary factor, namely, the substance now called vitamin B (or B_1). In the light of the developments in the field of the science of nutrition, especially since 1913, when the word vitamin was introduced, and the application of these observations to clinical medicine, there seems to be little doubt as to the validity of the deficiency disease hypothesis in relation to beriberi. It should be stated, however, that some clinicians, notably among the Japanese, still favor the view that beriberi is an infection.[5] Matsumura and his associates have recently claimed the isolation of a "beriberi bacillus" believed to be responsible for this disease, but Swineford[6] was not able to confirm this in his experience. Many of the arguments advanced by Ogata, by Matsumura and by Nagayo are not essentially different from those discussed by Vedder, who championed the deficiency disease theory. Concerning the thesis that the admin-

1. Vedder, E. B.: Beriberi, New York, William Wood & Co., 1913. A good discussion of the practical aspects of this matter will be found in chapter XVII.
2. Vedder, E. B., and Feliciano, R. T.: An Investigation to Determine a Satisfactory Standard for Beriberi-Preventing Rices, Philippine J. Sc. **35**: 351-389 (April) 1928.
3. Alvarez, W. C.: Opinions of Four Hundred and Seventy Physicians in Regard to the Advantages and Disadvantages of Using Bran and Roughage, Minnesota Med. **14**: 296-300 (April) 1931.
4. Vedder: Beriberi, p. viii.
5. Ogata, T.; Kaúakita, S.; Suzuki, T.; Kagoshima, S., and Oka, C.: Pathogenesis of Beriberi, Japan M. World **3**: 106, 1923; Chem. Abstr. **19**: 1728, 1925; abstr. Chem. Abstr. **17**: 2744, 1923. Matsumura, S.; Kakinuma, G.; Kawashima, K.; Tanikawa, K.; Ochiai, S.; Miyata, R.; Fujisaki, K.; Kanao, R.; Noguchi, K.; Aoki, K.; Sato, F.; Ito, K., and Suzuki, M.: The Etiology of Beriberi, J. A. M. A. **92**: 1325-1327 (April 20) 1929. Nagayo, Mataro: Beriberi and Rice Neuritis, ibid. **81**: 1435-1437 (Oct. 27) 1923.
6. Swineford, Oscar, Jr.: Beriberi in Virginia with Report of Case, Virginia M. Monthly **56**: 814-820 (March) 1930.

istration of vitamin B does not always bring about a complete cure of human beriberi and that therefore this disease cannot be essentially a vitamin B deficiency, attention should be called once more to the following points: (1) A complicated rather than a single deficiency may be in part responsible for this result, and (2) even in experimental beriberi in animals this may occur through failure of the vitamin given by mouth to reach the most vitally situated lesions soon enough, because of gastro-enteric disturbances. Observations in animals show that the time required for the vitamin to exert its curative effect depends to a considerable extent on the way the remedial agent is administered. Absorption from the gastro-intestinal tract is rapid enough in moderately advanced cases but too slow when the deficiency is of the most advanced type, in which case parenteral injections must be employed in order to save the animal. More extensive trials of parenteral administration of vitamin B in cases of human beriberi should contribute much toward the solution of this controversy.

Incidence in the United States.—Although the incidence of beriberi is very high in the Far East, this disease is of comparatively rare occurrence in the United States. Discussion of the prevalence of beriberi will be limited to its occurrence in North America. Because of its rarity, relatively few clinicians in the United States ever have the opportunity for observing beriberi. Most of the cases in adults that have been reported in the medical literature of this country have occurred among immigrants from the Far East [7] and individuals who have subsisted on definitely restricted diets either voluntarily,[8] or because they were inmates of institutions,[9] or because of economic and other factors.[10]

Pathology and Diagnosis.—According to Vedder's review of the pathology of beriberi in man, the chief finding is a multiple peripheral neuritis. The most recent contributions to this subject from the field of animal experimentation [11] confirm this and give further support to the view that human beriberi is essentially a vitamin B_1 deficiency. These observations indicate the important points that must be considered when making a differential diagnosis. The condition must be distinguished from other types of peripheral neuritis, notably those due to poisoning with alcohol and with metals. The history is of assistance here. When examining the patient with the view to determining whether the diet has been adequate, it is important to find out not only whether the individual partakes of those foods known to contain appreciable amounts of vitamin B_1 but how much he eats, because recent studies on animals indicate the great importance of the quantitative as well as the qualitative aspect of this matter. The experience of Goldberger in his study of the diet factor in relation to pellagra illustrates this point. Minot [12] also has called attention to this fact, and my experience with a recent case of beriberi in the New Haven Hospital impressed on me the importance of care in this regard.

Recent animal studies [13] have shown that what was formerly called vitamin B really consists of at least two physiologically active factors, the antineuritic substance (also called vitamin B, or B_1, or "antiberiberi" vitamin) and the heat-stable "antidermatitis" vitamin B_2 (or G, or "antipellagra" factor). It is interesting, therefore, to find that clinical cases of pellagra combined with beriberi have been reported.[14] The fact that such a condition is not encountered oftener probably finds its explanation in the diets used. The common beriberi-producing ration of the Far East is chiefly polished rice and fish. The rice is deficient with respect to both of the vitamin B factors, namely, the antineuritic substance and the pellagra-preventive factor, but the fish muscle contains fair amounts of the "antipellagra" substance. Corn meal, which is the staple food of the pellagrins in the Southern states, is low in its content of the pellagra-preventive vitamin but, when eaten in large amounts, supplies adequate quantities of the antineuritic substance.

It is an interesting fact that beriberi occurs much more frequently in men than in women.[15] If the results of recent studies on animals [16] can be legitimately applied to human beriberi, then this difference in incidence related to sex is to be attributed to the greater metabolic rate, activity and food consumption characteristic of most males.

Beriberi in Relation to Fevers and Gastro-Intestinal Disturbances.—There are reports in the literature of the occurrence of beriberi following prolonged fevers and gastro-intestinal disturbances. Of the fifty-two cases described by Bentley,[15] twenty-eight appear to have been the sequel of recurring malaria or dysentery and allied conditions. Bentley's observations were made in Java on persons who, in the light of my recent studies aimed at evaluation of human dietaries with respect to content of vitamin B_1, were subsisting on rations barely sufficient or "borderline" in character, and in whom, therefore, there was only a small factor of safety against the development of beriberi. Yacoub [17] reported three cases that followed relapsing fever, and in these instances there was a prolonged feeding of condensed milk, a food which, according to recent animal tests, contains appreciable amounts of the heat-stable "pellagra-preventive" substance but relatively small quantities of antineuritic vitamin. Nineteen per cent of Walshe's cases,[18] observed in Egypt, showed a previous history of malaria. The association of

7. Holmes, B., and Retinger, J.: An Apparent Recovery of a Chicago Chinaman from Beriberi After Three Doses of Vitamin Containing Extract of Rice Polishings, Illinois M. J. **29:** 178-180, 1916; Reed, A. C.: Beriberi: Report of Cases, J. A. M. A. **68:** 116-118 (Jan. 13) 1917. Abdou, N. T.: Descriptive Picture of Beriberi, ibid. **71:** 1298-1299 (Oct. 19) 1918.

8. Kepler, E. J.: Beriberi from a Diet of Raw Starch, J. A. M. A. **85:** 409-412 (Aug. 8) 1925.

9. Parker, H. B.: Beriberi: A Report on Beriberi in the County Jail at Elizabeth, N. J., Pub. Health Rep. **29:** 339-341, 1914.

10. Little, J. M., Jr.: Beriberi, J. A. M. A. **63:** 1287-1290 (Oct. 10) 1914. Scott, L. C., and Herrmann, G. R.: Beriberi ("Maladie des Jambes") in Louisiana, with Special Reference to Cardiac Manifestations, ibid. **90:** 2083-2090 (June 30) 1928.

11. Zimmerman, H. M., and Burack, Ethel: Lesions of the Nervous System Resulting from a Deficiency of the Vitamin B Complex, Proc. Soc. Exper. Biol. & Med. **28:** 645 (March) 1931.

12. Minot, G. R.: Some Fundamental Clinical Aspects of Deficiencies, Ann. Int. Med. **3:** 216-229 (Sept.) 1929.

13. Goldberger, Joseph; Wheeler, G. A.; Lillie, R. D., and Rogers, L. M.: A Further Study of Butter, Fresh Beef, and Yeast as Pellagra Preventives, with Consideration of the Relation of Factor P-P of Pellagra (and Black Tongue of Dogs) to Vitamin B, Pub. Health Rep. **41:** 297-318 (Feb. 19) 1926. Chick, Harriette; and Roscoe, Margaret H.: On the Composite Nature of the Water-Soluble B Vitamin, Biochem. J. **21:** 698-711, 1927. Sherman, H. C., and Axtmayer, J. H.: A Quantitative Study of the Multiple Nature of Vitamin B, J. Biol. Chem. **75:** 207-212 (July) 1927. Smith, S. L.: The Multiple Nature of Vitamin B, J. Home Econ. **20:** 241-244, 1928.

14. Cohoon, E. H., and Farnell, F. J.: Pellagra, with a Report of Cases, Boston M. & S. J. **168:** 50-56, 1913. Mendelson, R. W.: A Case of Combined Pellagra and Beriberi, J. Trop. Med. **26:** 6-7 (Jan. 1) 1923. Farnell, F. J., and Yacovlev, P. J.: Diagnosis of Pellagra and Beriberi, Ann. Clin. Med. **4:** 541-551 (Jan.) 1926.

15. Bentley, A. J. M.: Beriberi, Its Etiology, Symptoms, Treatment and Pathology, Edinburgh, Y. J. Pentland, 1893. Mitteilungen der Japanischen Beriberi-Studien-Kommission, Tokyo, 1911. Cannon, Alexander: Some Observations on Beriberi, Brit. M. J. **2:** 852-854 (Nov. 9) 1929.

16. Cowgill, G. R., and his associates (footnotes 23, 24 and 25).

17. Yacoub, K.: Notes on Three Cases of Beriberi Following Relapsing Fever and Due to Prolonged Feeding on Condensed Milk, Practitioner **100:** 290-291 (March) 1918.

18. Walshe, F. M. R.: On the Deficiency Theory of the Origin of Beriberi in the Light of Clinical and Experimental Observations on the Disease, with an Account of a Series of Forty Cases, Quart. J. Med. **11:** 320-338 (July) 1918.

malaria with beriberi occurs so frequently in Brazil that the physicians of that country [19] have been led to favor the view that beriberi is to a considerable extent an infection. The same attitude was taken by Cannon,[15] who, in reporting his cases in Hong Kong, stated that "the dry and dysenteric beriberis are really camouflaged forms of malaria, as proved by the invariable findings of the specific malarial parasites on careful examination." On the other hand, the observations of Lovelace [20] and Walcott [21] made in Brazil clearly support the view that the beriberi occurring in this region is a dietary deficiency disease as elsewhere. In the absence of vitamin B studies in animals, these conflicting reports would prove rather difficult of interpretation; when viewed in the light of the experiments that my associates and I [22] have conducted, they find a reasonable explanation. The experiments just referred to were performed on four different species of animals. The results support the view that the amount of vitamin B required by the organism is related to the amount of food consumed, or the total metabolism; when the animal is restricted to a diet deficient in vitamin B, and its metabolism is increased by forced exercise [23] or by the administration of thyroid tissue,[24] signs of vitamin B deficiency appear much sooner than otherwise. The indications from such studies are that more vitamin B is required whenever the metabolic rate is raised. It is reasonable to expect, therefore, that individuals subsisting on diets the vitamin B contents of which are too small or just barely sufficient should be brought to a condition of extreme vitamin B deficiency when subjected to a prolonged regimen of fever or of heightened metabolism.

In the same way one may explain the frequency with which beriberi has been shown to follow a prolonged siege of gastro-intestinal disturbance, such as is represented by dysentery. Observations on animals [25] have shown that the feces contain appreciable amounts of vitamin B. This fact is so important that coprophagy on the part of the experimental animals must be prevented whenever foods are being assayed for their content of the antineuritic vitamin, if the results are to be at all quantitative. Much of the vitamin present in the intestinal excreta is doubtless the result of the activity of certain strains of bacteria,[26] but some of it may have originated in the food ingested and have escaped absorption in its passage through the alimentary tract. At the present time, practically nothing is known concerning the locus of absorption of this vitamin in the intestine. Cowgill, Rosenberg and Rogoff [27] were able to show that in dogs given large volumes of water daily, signs of lack of vitamin B appear much sooner than when the animals are allowed water ad libitum. It is not unreasonable to attribute the development of beriberi in cases of prolonged diarrheas of whatever cause to failure of the individual to absorb a sufficient fraction of the ingested vitamin to meet the needs of the organism; this failure of absorption becomes more important as a contributory cause of beriberi when the amount of vitamin B in the diet is low or only barely sufficient; in such cases the factor of safety against beriberi is small.

To what extent gastric achlorhydria is a factor favorable to the development of beriberi or is the result of this disease, it is impossible to say at the present time. This condition occurs often in beriberi, but not invariably, and has been reported to develop in animals fed diets lacking vitamin B.[28] Wohl [29] has described a case as "avitaminosis in the course of diabetes . . . with symptoms and lesions of beriberi predominating." Minot [12] reported having seen two cases of diabetes associated with peripheral neuritis and achylia gastrica, "whose symptoms slowly improved upon taking large amounts of a concentrate of yeast," and states that "one must wonder if achylia gastrica is not a factor that can inhibit the utilization of both the P. P. (pellagra-preventive) and antineuritic factor of vitamin B." Gastric ulcer would seem to be another type of gastric disturbance likely to lead to beriberi or to a milder form of vitamin B deficiency because the treatment involves essentially a marked restriction of diet; prolonged subsistence on a ration of cream and other foods valuable because they do not stimulate gastric secretory processes certainly operates to favor the development of a condition of vitamin B shortage. The duration of this dietary treatment is obviously an important factor here.

Beriberi has also been reported as related in some way to jaundice. In a study of forty cases of beriberi, Walshe [18] noted such an association but after due consideration of his data decided against the jaundice being related etiologically to beriberi. It is possible to take the view that the jaundice in such cases represents a complication in no way related to beriberi. One may also consider the jaundice as evidence that the alimentary functions are not normal and that the development of beriberi is favored by the gastro-intestinal disturbance, especially when the diet is only barely adequate with respect to its content of vitamin B.

To the careful clinician the numerous conditions predisposing to the development of vitamin B deficiency that have just been discussed will suggest others as worthy of attention. Obstructive states, in which intake of sufficient nourishment is difficult, may be mentioned. Chronic wasting diseases constitute another category of interest.

The Heart in Beriberi.—Students of beriberi have long recognized cardiac manifestations as important elements of the syndrome of this disease. There is a definite hypertrophy, chiefly of the right side of the heart. Irregularity, extrasystole, flutter and fibrillation do not occur. The usual heart remedies are without effect. According to Vedder, "exceptionally, cases occur in which cardiac dilatation and sudden death are the first symptoms noted." Sudden death has also been observed in dogs subsisting on vitamin B-deficient

19. Couto, Miguel: Beriberi, Arch. f. Schiffs- u. Tropen-Hyg. **30**: 275-284 (July) 1926; abstr. J. A. M. A. **87**: 712 (Aug. 28) 1926.
20. Lovelace, Carl: The Etiology of Beriberi, J. A. M. A. **59**: 2134-2137 (Dec. 14) 1912.
21. Walcott, A. M.: Beriberi in the Amazon Basin, J. A. M. A. **65**: 2145-2147 (Dec. 18) 1915.
22. Cowgill, G. R.: Unpublished observations.
23. Cowgill, G. R.; Rosenberg, H. A., and Rogoff, J.: Studies in the Physiology of Vitamins: XVI. The Effect of Exercise on the Time Required for the Development of the Anorexia Characteristic of Lack of Undifferentiated Vitamin B, Am. J. Physiol. **98**: 589-594 (Nov.) 1931.
24. Himwich, H. E.; Goldfarb, Walter; and Cowgill, G. R.: The Vitamin B Complex in Relation to Food Intake During Hyperthyroidism, Proc. Soc. Exper. Biol. & Med. **28**: 646 (March) 1931.
25. Steenbock, Harry; Sell, M. T., and Nelson, E. M.: Vitamin B: I. A Modified Technic in the Use of the Rat for Determinations of Vitamin B, J. Biol. Chem. **55**: 399-410 (March) 1923. Salmon, W. D.: Vitamin B in the Excreta of Rats on a Diet Low in This Factor, ibid. **65**: 457-462 (Sept.) 1925. Smith, A. H.; Cowgill, G. R., and Croll, H. M.: A Note on the Technic for Studying Vitamin B., ibid. **66**: 15-21 (Nov.) 1925.
26. Damon, S. R.: Bacteria as a Source of Water-Soluble B Vitamin, J. Biol. Chem. **48**: 379-384 (Oct.) 1921; Acid-Fast Bacteria as a Source of Vitamin B, J. Path. & Bact. **27**: 163-169 (April) 1924. Heller, V. G.; McElroy, C. H., and Garlock, B.: The Effect of the Bacterial Flora on the Biologic Test for Vitamin B, J. Biol. Chem. **65**: 255-264 (Aug.) 1925.
27. Cowgill, G. R.; Rosenberg, H. A., and Rogoff, J.: Studies in the Physiology of Vitamins: XIV. The Effect of Administration of Large Amounts of Water on the Time Required for Development of the Anorexia Characteristic of a Deficiency of the Vitamin B Complex, Am. J. Physiol. **95**: 537-541 (Dec.) 1930.
28. Gilman, A.: Chemical and Physiological Investigations on Canine Gastric Secretion, Dissertation, Yale University, 1931.
29. Wohl, M. G.: Avitaminosis in the Course of Diabetes: Occurrence in a Case with Symptoms and Lesions of Beriberi Predominating, J. A. M. A. **87**: 901-906 (Sept. 18) 1926.

diets.[30] The older explanation of this sudden fatality has been that it is due to an extensive degeneration of the vagus nerves. The recent studies of Aalsmeer and Wenckebach[31] support another explanation. These authors believe that the fundamental process in beriberi is water retention and consequent swelling of certain vital tissues, especially the heart and striated muscle. They make the point that the cardiac dilatation may be detected long before the first manifestations of polyneuritis. This observation should be of great significance to clinicians, particularly those specializing in cardiac disorders. The effect of the administration of vitamin B on the beriberi heart is striking. There is a rapid return of the heart to normal size, this being accompanied by a marked secretion of urine. Wenckebach[32] cites the work of Rigler, seeming to show that the highly purified vitamin B preparation of Jansen and Donath[33] acts as a heart hormone or "automatin." Further research along this line will be awaited with interest.

Infantile Beriberi.—In the Far East the incidence of infantile beriberi is very high. The great prevalence of this disease among rice-eating people is doubtless due to at least three important facts: 1. During the first six months of its life the human infant subsists almost entirely on milk and is therefore in the category of individuals who live on a restricted dietary. 2. The amount of antineuritic vitamin B present in the milk has been shown to be dependent primarily on the quantity ingested by the mother.[34] 3. Most of the diets consumed by those who use white rice as the staple food are deficient or just barely adequate with respect to content of antineuritic vitamin; under such dietary conditions the amount of vitamin ingested by the mother above her own immediate requirement and thus available for transfer to her milk is small, and as a consequence the milk is deficient with respect to the vitamin.

Moore and Brodie[35] have reported an instance of hemorrhage in a new-born infant, which presented pathologic evidences of beriberi. The mother's diet during the prenatal period was markedly deficient in antineuritic vitamin. In commenting on this case the authors stated that "diets restricted by poverty, pernicious vomiting, diabetes or other causes need careful scrutiny from the standpoint of vitamins." In order to elucidate more fully the relationship of vitamin B in the maternal diet to infantile beriberi, experiments were also performed on rats,[36] with results abundantly confirming the clinical observations. Additional confirmatory evidence may be cited in the work of Sure[34] and of others.[37] The implications of these observations to the clinician are obvious. Vitamin B should be administered to the mother during the gestation period as a protective measure and to both the mother and the infant after parturition. Careful regulation of the diet may be a sufficient therapeutic measure to adopt during the prenatal period in most cases, but when complications are present it may be advisable to administer concentrates of the antineuritic vitamin. When severe symptoms of beriberi have already developed in the infant, they may be obviated almost miraculously by administration of suitable amounts of a concentrated form of vitamin B.

OTHER POSSIBLE (?) CONDITIONS OF EXTREME VITAMIN B DEFICIENCY WORTHY OF CONSIDERATION

There are many conditions besides beriberi in which injury to the nervous system is a prominent feature of the disorder. Spinal cord lesions are found in advanced cases of pernicious anemia. Lesions in the brain have been described as characteristic of human pellagra. Gildea and his associates[38] reported the appearance of lesions described as "disseminate sclerosis" in the spinal cords of dogs fed diets deficient chiefly in antineuritic vitamin B. Zimmerman and Burack[11] disagree with Gildea and his collaborators as to the interpretation of the histologic preparations obtained by the latter. It would be generalizing too widely and on too uncertain data to say that in all these nervous disorders lack of antineuritic vitamin is an etiologic factor. On the other hand, in the face of the uncertainty as to what part is played by this vitamin in the nutrition of the nervous system, it seems justifiable to advocate administration of the vitamin in such cases, especially when this therapeutic measure is so easy to carry out and cannot do any harm. It is of interest to learn that one clinician is experimenting with vitamin B therapy in cases of delirium tremens. In this connection it is pertinent to cite the claim of both Kimura[39] and Lhermitte[40] that, so far as the central nervous system is concerned, their histologic pictures obtained from cases of human beriberi are indistinguishable from those of toxic polyneuritis. This is a field of investigation worthy of careful cultivation by the clinician.

CONDITIONS OF SLIGHT AND MODERATE SHORTAGE OF VITAMIN B

Anorexia.—In the introductory remarks I called attention to the lack of agreement among clinicians as to the significance of vitamin B in conditions other than manifest beriberi, which represents essentially an extreme deficiency of this accessory food factor. Evidence showing the importance of an adequate intake of this vitamin not only in preventing beriberi but in the maintenance of a normal voluntary intake of food has come from researches on animals. Karr[41] and Cowgill[30] have been able to demonstrate in dogs a relation between vitamin B and the urge to eat. A description of a representative experiment follows:

The animal is fed an artificial diet adequate in all known respects except for vitamin B. Over a variable period, depend-

30. Cowgill, G. R.: A Contribution to the Study of the Relation Between Vitamin B and the Nutrition of the Dog, Am. J. Physiol. **57:** 420-436 (Oct.) 1921.

31. Aalsmeer, W. C., and Wenckebach, K. F.: Herz und Kreislauf bei der Beriberi-Krankheit, Berlin, Urban & Schwarzenberg, 1929.

32. Wenckebach, K. F.: The Heart and Circulation in Tropical Avitaminosis (Beriberi), Lancet **215:** 265-268 (Aug. 11) 1928.

33. Jansen, B. C. P., and Donath, W. F.: Isolation of Antiberiberi Vitamin, Mededeel. v. d. dienst d. volksgez-ondh. in Nederl.-Indië, part I, 1927.

34. Sure, Barnett: Dietary Requirements for Fertility and Lactation: XV. The Inefficiency of the Lactating Mother (Mus Norvegicus-Albinus) in Secreting Vitamin B in the Milk, and the Relation of This Phenomenon to Infant Mortality (Detailed Report), J. Biol. Chem. **76:** 685-700 (March) 1928.

35. Moore, C. U., and Brodie, J. L.: The Relation of Maternal Diet to Hemorrhage in the New-Born, Am. J. Dis. Child. **34:** 53-60 (July) 1927.

36. Moore, C. U.; Brodie, J. L., and Hope, R. B.: Some Effects on the Young of Inadequate Maternal Diets: I. Polyneuritis and Hemorrhage, Am. J. Physiol. **82:** 350-357 (Oct.) 1927.

37. Guest, A. E.; Nelson, V. E.; Parks, T. B., and Fulmer, E. I.: Diet in Relation to Reproduction and Rearing of Young, Am. J. Physiol. **76:** 339-348 (April) 1926. Macy, Icie G.; Outhouse, Julia; Graham, Alice, and Long, M. Louisa: Human Milk Studies: III. The Quantitative Estimation of Vitamin B, J. Biol. Chem. **73:** 189-201 (May) 1927. Evans, H. M., and Burr, G. O.: The Amount of Vitamin B Required During Lactation, ibid. **76:** 263-272 (Jan.) 1928.

38. Gildea, E. F.; Kattwinkel, E. E., and Castle, W. B.: Experimental Combined System Disease, New England J. Med. **202:** 523-527 (March 13) 1930.

39. Kimura, O.: Histologische Degenerations- und Regenerationsvorgänge im peripherischen Nervensystem, Mitt. path. Institut Univ. zu Sendai, Japan **1:** 1, 1919; abstr., Med. Sc. Abstr. and Reviews **2:** 41, 1920.

40. Lhermitte, J.: Les lésions cérébrales de la polynévrite avitaminique, Rev. neurol. **2:** 6, 1916.

41. Karr, W. G.: Some Effects of Water-Soluble Vitamin on Nutrition, J. Biol. Chem. **44:** 255-276 (Nov.) 1920.

ing on the previous nutritive history of the animal, the dog consumes all the food offered within a few minutes. Then anorexia appears; the dog may eat part of the food in the course of a few hours and repeat this behavior for several days. The anorexia may be partial or may become fairly complete. If at any time after the anorexia first appears, a sufficient amount of vitamin-containing material is given, the appetite is restored and the animal eats ravenously the same food that was previously refused.

In the earlier experiments the test substances were placed in the stomach of the animal rather than in the food mixture in order to avoid the possible effect of mere change in the taste of the ration. Later it was found that if the test material was mixed with the food the animal might be induced to eat a small amount. If, however, by eating this small amount vitamin B was not obtained, the anorexia continued. It has even proved possible to restore the urge to eat to vitamin-deficient dogs by intravenous injection of the missing dietary essential.[42] What is most important to remember in this connection is the fact that other dogs, given precisely the same experimental diet plus a daily small but sufficient amount of a vitamin B concentrate, have been maintained in excellent nutritive condition with perfect appetite for the food offered for about a year and a half (540 days).[43]

This anorexia, whatever its complete explanation may be, should be of interest to the clinician. Loss of the urge to eat is generally regarded not as a disease in itself but as a symptom, and this is doubtless the correct attitude to take. It is obvious, also, that loss of interest in food may be the result of the operation of many factors, some psychic and others associated with manifest disease quite unrelated to vitamin B deficiency; it is not logical to assume that administration of vitamin B in such cases will restore the urge to eat. The true significance to the clinician of the results of these animal experiments, however, should be clear. In any case presenting anorexia as an important feature of the syndrome, shortage of vitamin B as an etiologic factor may be readily ruled out by administration of liberal amounts of this dietary essential.

Clinical evidence has already been obtained showing that this condition of moderate shortage of vitamin B does occur in the human species. It has been shown that many marasmic babies have their interest in food and the urge to eat restored by the administration of vitamin B.[44] Newburgh [45] succeeded in increasing the voluntary food intake of a mentally incompetent young woman from about 400 to approximately 2,000 calories a day by the simple expedient of administration of vitamin B. Swineford [6] has described a case diagnosed as mild beriberi resulting from a prolonged siege of typhoid and inadequate nutrition during convalescence. Administration of vitamin B brought about prompt correction of the anorexia and disappearance of the neuromuscular symptoms suggestive of beriberi. It is not unlikely that certain instances of anorexia noticed in convalescents who have subsisted on hospital fare for long periods and who have an unrecognized poor utilization of the vitamin ingested really represent a moderate shortage of vitamin B. This is a field of investigation and clinical trial that presents interesting possibilities.

In this connection it is of interest to cite the observations of Stucky and Rose,[46] who made blood studies in dogs subsisting on vitamin B-deficient diets. Anhydremia was one finding of note. When the vitamin-deficient dogs were given the missing factor they promptly and voluntarily consumed large volumes of water and voided much urine. These observations may have a bearing on the question of the origin of the edema and the anhydremia in "wet" and in "dry" beriberi, respectively. They also suggest that the anhydremia in certain marasmic infants owes its origin in the last analysis to a shortage of vitamin B. The observation of Cowgill, Rosenberg and Rogoff,[27] that this anorexia appears much sooner in dogs given forced administration of large amounts of water daily, suggests, also, that when fluid is given to marasmic babies, vitamin B should be administered at the same time. These are possibilities that must await clinical trial before being accepted in toto.

Hoobler [44] has studied in infants a syndrome described as indicative of lack of antineuritic vitamin. Features of the symptom complex are anorexia, a strange plaintive cry and a certain type of stiffness of the arms, legs and neck believed to be similar to the spastic condition noted in animals suffering from vitamin B deficiency. This condition is readily alleviated by ingestion of sufficient amounts of antineuritic vitamin.

It is obvious that all the conditions that I have cited as favorable to the development of beriberi, i. e., heightened metabolism, faulty gastro-enteric functions, and the like, also operate to bring about a condition of moderate shortage of vitamin B and therefore should be of special interest to American clinicians.

Restriction of Growth.—Several investigators [47] have commented on the prevalence of faulty nutrition among children both in this country and in Europe. Until recently it has been difficult to say to what extent a deficiency of antineuritic vitamin is a factor here in limiting growth. Inadequate amounts of calcium and of vitamin A may be playing a greater part. The studies of Morgan and Barry,[48] however, show conclusively that shortage of vitamin B can be a factor in limiting the growth of American school children. When one considers the types of diet that many of the poorer classes are undoubtedly restricted to, especially in such a period as the present world-wide economic depression, the observations of Morgan and Barry become even more significant. Insufficient intake of antineuritic vitamin is probably more serious in children than in adults on account of the child's lower capacity for tissue storage of vitamin reserve and a relatively greater need for this factor to meet the

42. Cowgill, G. R.: Studies in the Physiology of Vitamins: II. Parenteral Administration of Vitamin B—Mammalian Experiments, Am. J. Physiol. **66**: 164-175 (Sept.) 1923.

43. Cowgill, G. R.; Deuel, H. J., Jr., and Smith, A. H.: Studies in the Physiology of Vitamins: III. Quantitative Aspects of the Relation Between Vitamin B and Appetite in the Dog, Am. J. Physiol. **73**: 106-126 (June) 1925.

44. Hess, A. F.: Infantile Scurvy: The Therapeutic Value of Yeast and of Wheat Embryo, Am. J. Dis. Child. **13**: 98-109 (Jan.) 1917. Eddy, W. H., and Roper, J. C.: The Use of Pancreatic Vitamin in Cases of Marasmus, ibid. **14**: 189-201 (Sept.) 1917. Byfield, A. H., and Daniels, Amy L.: The Antineuritic and Growth Stimulating Properties of Orange Juice, ibid. **19**: 349-358 (May) 1920. Reyher, P.: Ueber die Wirkung der Hefe bei Frühgeborenen und debilen Kindern, Ztschr. f. Kinderh. **36**: 134-150, 1923. Bloxsom, A. P.: Vitamin B Requirements in Infancy, Am. J. Dis. Child. **37**: 1161-1168 (June) 1929. Waring, J. I.: Beriberi in Infants, ibid. **38**: 52-56 (July) 1929. Haas, S. V.: Beriberi in Late Infancy: Result of Celiac Disease, Arch. Pediat. **46**: 467-478 (Aug.) 1929. Hoobler, B. R.: Symptomatology of Vitamin B Deficiency in Infants, J. A. M. A. **91**: 307-310 (Aug. 4) 1928. Dennett, R. H.: Routine Use of the Vitamin B Factor in Infant Feeding, ibid. **92**: 769-772 (March 9) 1929. Hoobler, B. R.: Use of Vitamin B in Diets of Infants: Further Observations, ibid. **96**: 675-677 (Feb. 28) 1931.

45. Newburgh: Personal communication to the author.

46. Stucky, C. J., and Rose, W. B.: Studies in the Physiology of Vitamins: VII. Hemoglobin, Solids, Sugar and Chloride Changes in the Blood of Vitamin B-Deficient Dogs, Am. J. Physiol. **89**: 1-17 (June) 1929.

47. McCollum, E. V., and Simmonds, Nina: The Newer Knowledge of Nutrition, ed. 4, New York, Macmillan Company, 1929. Mellanby, Edward: Diet and Disease, Brit. M. J. **1**: 515 (March 20) 1926.

48. Morgan, Agnes F., and Barry, Margaret M.: Underweight Children, Am. J. Dis. Child. **39**: 935-947 (May) 1930.

requirements of growth as well as of maintenance. It is especially important to realize that vitamin B is a dietary essential, and therefore care should be taken to see that more than enough of this factor is being supplied at all times both to the growing child and to the adult.

SOURCES OF VITAMIN B FOR CLINICAL USE

Foods.—Alterations in the diet designed to increase the amount of vitamin B furnished to the patient constitute one very important and simple therapeutic measure. Tables showing relative amounts of vitamin B in common foods are available elsewhere [49] and need not be presented here. A few general remarks may be helpful. Yeast and wheat germ are two excellent sources of this vitamin and furnish the starting point for the preparation of many special products that are essentially concentrates of this dietary factor. Among the body tissues containing relatively large amounts are the glandular organs, notably the liver, kidney and brain, all of these being much richer than muscle. The whole grains because of their content of germ contain appreciable amounts, in contrast to the highly milled products such as white flour and degerminated corn meal. Among the fruits and vegetables, tomatoes, raw cabbage, fresh spinach and legumes have been found to contain more than orange or lemon juices, onions, lettuce or cauliflower. In the egg the vitamin is located in the yolk. Milk, although a good source of the pellagra-preventive substance, cannot be rated as containing a large amount of vitamin B_1. For this reason it is a valuable therapeutic measure to supplement the infant's formula-milk with some source of the antineuritic vitamin.

Special Concentrates of Vitamin B_1.—In many cases it is important to combine dietary regulation with administration of special concentrates rich in vitamin B_1, in order to secure prompt alleviation of symptoms. Numerous products are now available for this purpose. It is my opinion that whenever any product of this nature is offered for use by the clinician there should be evidence that the material really contains an appreciable amount of the antineuritic vitamin; this evidence may be obtained by animal tests. The wise clinician will insist that such proof be obtained.

At the present time there do not appear to be available in any reasonable quantity concentrates of vitamin B that may with impunity be administered parenterally to human beings. The recent appearance of a case of beriberi in New York City, in which administration of the vitamin by mouth was practically impossible, indicates the importance of having on hand preparations suited for therapy in such contingencies.

49. Sherman, H. C.: The Chemistry of Food and Nutrition, ed. 3, New York, Macmillan Company, 1926, p. 598. Rose, Mary S.: Laboratory Handbook for Dietetics, ed. 3, New York, Macmillan Company, 1929.

Lissauer's Dementia Paralytica.—The usual case of dementia paralytica shows at autopsy diffuse atrophy of the cerebral cortex, which is most intense in the frontal lobes and progressively decreases in intensity toward the posterior poles of the hemisphere. Such a distribution of the atrophy is expected from the character of the clinical course, which offers no symptoms or signs of a focal nature. In contrast to these usual cases are the cases which during life show focal signs and at autopsy striking atrophy of certain convolutions. . . . Heretofore, dementia paralytica has been considered only a disease of the cortex, and all lesions found in the white matter have usually been thought to be secondary.—Merritt, H. H., and Springlova, M.: *Arch. Neurol. & Psychiat.* **27**:987 (May) 1932.

Committee on Foods

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COMMITTEE ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOLLOWING ANY NECESSARY CORRECTIONS OF THE LABELS AND ADVERTISING TO CONFORM TO THE RULES AND REGULATIONS. THESE PRODUCTS ARE APPROVED FOR ADVERTISING IN THE PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION, AND FOR GENERAL PROMULGATION TO THE PUBLIC. THEY WILL BE INCLUDED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION.

RAYMOND HERTWIG, Secretary.

RECOLAC

A food for infants, containing soluble casein, lactalbumin, lactose, milk salts (all derived from fresh cow's milk), dextrins, maltose, salts, extracts of yeast and wheat embryo, animal and vegetable fats and cod liver oil; the whole so proportioned as to satisfy almost all nutritional requirements of infants; contains vitamins A, B, D and G.

Manufacturer.—Mead Johnson and Company, Evansville, Ind.

Description.—A food for infants, containing soluble casein (potassium caseinate), lactalbumin, lactose, milk salts, dextrins, maltose, salts, extracts of yeast and wheat embryo, oleo, coconut and cod liver oils; contains vitamins A, B, D and G.

Manufacture.—All milk used in the preparation of this product comes under inspection of the Chicago Board of Health and complies with its requirements. On receipt at the factory it is pasteurized by the usual standard "holding" process. The pasteurized milk, almost completely defatted by centrifugalization, is acidified with sufficient dilute phosphoric acid solution to precipitate the casein in small flocks. The casein is permitted to settle and the whey is removed by decantation.

The precipitated casein is washed with water by decantation and made neutral to phenolphthalein with potassium hydroxide solution, whereby the casein is converted to potassium caseinate. Recolac therefore contains potassium caseinate in place of calcium caseinate of ordinary milk.

The separated whey is treated with calcium hydroxide to precipitate the added phosphoric acid and soluble calcium salts of the milk; the precipitate is removed by filtration and centrifugalization.

The decalcified whey and calculated quantities of potassium caseinate, di-calcium phosphate, oleo, coconut and cod liver oils and Dextri-Maltose with vitamin B (essentially maltose, dextrins, extracts of yeast and wheat germ and mineral salts) are combined and homogenized under high pressure to disperse the fat in very fine globules. The homogenized mixture is concentrated under "vacuum" (2 inches of mercury) and dried by a "vacuum" (2 inches of mercury) drum drier method. Recolac, the final dry powder, is packed in tins and hermetically sealed in an atmosphere of nitrogen.

Glass-enamel tanks are used in the preparation of the whey and the potassium caseinate. Great care is exercised in the sanitation of all equipment.

Analysis (submitted by manufacturer).—	per cent
Moisture	1.4
Ash	3.3
Protein (N × 6.25)	16.0
Fat (ether extract)	27.0
Lactose (copper reduction method)*	18.7
Reducing sugars as maltose*	17.4
Dextrins (by difference)*	16.2
(proximate analysis of normal dilution— 1 oz. + 7 oz. water)	
Ash	0.4
Protein (N × 6.25)	2.0
Fat (ether extract)	3.4
Carbohydrates	6.5
*p*H	7.2
Analysis of Mineral Content	
Calcium (Ca)	0.25
Magnesium (Mg)	0.04
Sodium (Na)	0.30
Potassium (K)	1.03
Iron (Fe)	0.002
Copper (Cu)	0.00046
Phosphorus (P)	0.41
Sulphur (S)	0.04
Chlorine (Cl)	0.45

Reichert-Meissl number of Recolac fat, 2.8

* Calculated from analyses of component ingredients.

Calories.—5.2 per gram; 148 per ounce.

Micro-Organisms.—The manufacturer guarantees the absence of pathogenic organisms.

Claims of Manufacturer.—Recolac reliquefied to normal dilution of 1 ounce of powder + 7 ounces of water forms a well balanced food for infants who are deprived of breast milk. It may be used as a complemental or supplemental feeding and is particularly desirable for the traveling mother. Recolac keeps well in the sealed can, is readily miscible in water, and is simple to use. The necessary accessory food factors, such as orange juice and cod liver oil, should be used when feeding Recolac.

PURITY 2 LOAVES IN 1 BREAD

Manufacturer.—Purity Baking Company, Decatur and Pana, Ill.

Description.—A white bread made by the sponge dough method.

Manufacture.—The sponge dough ingredients, patent flour of southwest wheat, water, yeast, malt syrup, lard and a yeast food containing calcium sulphate, ammonium chloride, sodium chloride and potassium bromate, are mixed in a high speed mixer. The sponge dough is fermented for from four to five hours, after which are added flour, water, salt, sucrose, dry skim milk and lard to make the completed dough, which is cut into pieces of desired weight. The pieces are fermented for a short time, molded into loaf form, panned, further fermented, baked for from thirty to thirty-five minutes, cooled, and wrapped in wax-paper.

The factory, equipment and storage rooms are kept in strictly sanitary condition.

Analysis (submitted by manufacturer).—	per cent
Moisture (entire loaf)	34.8
Ash	0.8
Fat	1.4
Protein (N × 6.25)	9.4
Crude fiber	0.3
Carbohydrates other than crude fiber (by difference)	53.3

Calories.—2.6 per gram; 74 per ounce.

Claims of Manufacturer.—A bread of good quality.

NICOLET BRAND GOLDEN SYRUP

(85 per cent corn syrup, 15 per cent refiners' syrup)

Packer.—D. B. Scully Syrup Company, Chicago.

Distributor.—Frank C. Schilling Company, Green Bay, Wis.

Description.—A table syrup; a corn syrup base (85 per cent) with refiners' syrup (15 per cent).

Manufacture, Analysis, Calories and Claims of Manufacturer.—See these sections for Banner Blue Golden Syrup with Cane Flavor (THE JOURNAL, March 5, 1932, p. 817).

LOUDON BRAND TOMATO JUICE

Manufacturer.—The Loudon Packing Company, Terre Haute, Ind.

Description.—Canned tomato juice; retains in large measure the vitamin content of the raw juice used; contains a small amount of added salt.

Manufacture.—The tomatoes are obtained from neighboring territory and are graded and inspected on sorting tables. Only the ripe better quality tomatoes are used for the juice. Most of the tomatoes are canned within eight to twelve hours after picking, the maximum time being eighteen hours.

The tomatoes are conveyed in sluices to squirrel cage washers and subjected to high pressure sprays which break up overripe or defective tomatoes, enabling their removal on the sorting belt. The washed tomatoes are carefully inspected, sorted and trimmed on conveyor belts, and bad tomatoes are discarded. The selected tomatoes are lightly scalded in a steam box and macerated in a water vapor atmosphere in cyclones which express the juice. The juice flows to holding tanks and is pumped in enamel lined pipes to "finishers," where it is forced through fine screens to eliminate coarse pulp. The juice outlet line from the holding tank extends to the bottom of the tank to avoid foaming and introduction of air, the tank never being emptied to a point at which the outlet line is exposed to the air. From the "finishers" the juice is pumped through enamel lined pipes to a "vacuum" tank, into which it is sprayed to expose a maximum surface to the "vacuum" of three inches mercury pressure. The juice is homogenized to prevent separation of insoluble matter, is conveyed into the bottoms of preheating tanks to avoid foaming and introduction of air, is quickly heated to 87 C., and, after salt is added, is automatically filled into cans at about 85 C. After sealing, the product is pasteurized (final temperature, 85 C.), quickly cooled and stored.

Analysis (submitted by manufacturer).—	per cent
Moisture	95.1
Total solids	4.9
Ash	0.9
Chlorides as NaCl	0.7
Fat (ether extract)	0.1
Protein (N × 6.25)	1.0
Reducing sugars as invert	2.3
Sucrose	none
Crude fiber	0.2
Carbohydrates other than crude fiber (by difference)	2.4
Acidity as citric acid	0.3

Calories.—0.2 per gram; 6 per ounce.

Vitamins.—The use of mature tomatoes, the careful factory control, the continuous method of manufacture, the exposure of the fruit juice to an atmosphere of steam only in the factory equipment, and the withdrawal in the "vacuum" treatment of air naturally occurring in the juice assure maximum retention of the natural vitamin content.

Claims of Manufacturer.—This tomato juice is a good source of vitamins A and B and an excellent source of vitamin C; for infant feeding and general table use.

HELMS OLYMPIC WHITE BREAD AND HELMS HOME LIKE BREAD

Manufacturer.—Helms Bakeries, Ltd., Los Angeles.

Description.—A white bread made by the sponge dough method (method described in THE JOURNAL, March 5, 1932, page 817); prepared from patent flour, water, yeast, a yeast food containing calcium sulphate, ammonium chloride, sodium chloride and potassium bromate, sweetened condensed skim milk, salt, lard, sucrose, invert sugar and tartaric acid.

Analysis (submitted by manufacturer).—	per cent
Moisture (entire loaf)	34.2
Ash	1.9
Fat (Polenske-Grujic method, Leach "Food Inspection and Analysis," ed. 4, p. 343)	2.4
Protein (N. × 6.25)	9.5
Crude fiber	0.2
Carbohydrates other than crude fiber (by difference)	51.8

Calories.—2.7 per gram; 77 per ounce.

Claims of Manufacturer.—A bread of good quality.

SMACO (204) CONCENTRATED LIQUID HALF-SKIMMED MILK (STERILIZED)

Manufacturer.—S. M. A. Corporation, Cleveland.

Description.—Evaporated half-skimmed milk containing half as much milk fat as ordinary evaporated milk.

Manufacture.—See this section for SMACO (203) Concentrated Liquid Whole Milk (Sterilized) (THE JOURNAL, July 25, 1931, p. 248); half-skimmed milk is used instead of whole milk.

Analysis (submitted by manufacturer).—	per cent
Moisture	77.2
Total solids	22.8
Ash	1.5
Fat (ether extract)	4.0
Protein (N × 6.38)	6.9
Lactose (by difference)	10.0
*p*H	6.4

Calories.—1.0 per gram; 28 per ounce.

Micro-Organisms.—See this section for SMACO (203) Concentrated Liquid Whole Milk (Sterilized).

Claims of Manufacturer.—This product is intended especially for infant feeding for use wherever an evaporated partially skimmed milk is indicated.

PORTAGE BRAND GOLDEN CORN SYRUP

(85 per cent corn syrup, 15 per cent refiners' syrup)

Packer.—D. B. Scully Syrup Company, Chicago.

Distributor.—Portage Wholesale Company, Portage, Wis.

Description.—A table syrup; a corn syrup base (85 per cent) with refiners' syrup (15 per cent).

Manufacture, Analysis, Calories and Claims of Manufacturer.—See these sections for Banner Blue Golden Syrup with Cane Flavor (THE JOURNAL, March 5, 1932, p. 817).

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, JUNE 25, 1932

EARLY STAGES OF VITAMIN A DEFICIENCY

Early in the study of the effects of a lack of vitamin A in the diet, several striking and serious symptoms of this form of avitaminosis were brought to notice. The decline in weight, in the case of growing animals deprived entirely of this vitamin, established the belief that it is essential to nutritive welfare. When Osborne and Mendel, in 1913, described eye disease, now identified as xerophthalmia, as a frequent consequence of deprivation of vitamin A, and McCollum, in 1917, called attention to respiratory disturbances under the same conditions of an inadequate dietary regimen, the consideration of the possibility that shortage of vitamin A in the diet is of serious moment in human well being rapidly began to develop. Meanwhile the pathology of experimental avitaminosis, related to lack of vitamin A, began to be elucidated further. The keratinization of certain tissues was noted, culminating in the extensive observations of Wolbach and Howe at Harvard University showing widespread metaplasia of the cylindric, cuboidal or transitional type of epithelium to the squamous, keratinizing type. This is not due merely to inanition, which may bring about atrophy of tissues but not metaplasia. Infection has also been injected into the pathologic picture by several of the investigators. Furthermore, when there is vitamin A shortage in the diet of laboratory animals there are alterations in the desquamative changes in the vaginal epithelium so characteristic of the estrual rhythm.

It seems to be generally agreed that by the time the body's reserves of vitamin A have been depleted and growth ceases in the young, the experimental animals become more susceptible to bacterial infection. It is not easy, however, to demonstrate cogently in what way, if any, there is an actual lowering of resistance to the effects of micro-organisms. At a stage when the protective epitheliums are no longer normal, it is readily conceivable that the exposed defective membranes may fail to offer the usual protection against bacterial invasion. Some students of the subject have suggested that there may also be a humoral protective effect attributable to adequate provision of vitamin A. On such grounds, some writers have ventured without hesitation to describe vitamin A as an antiinfective agent. It would be of great importance if there were convincing evidence of such a property. Unfortunately, our knowledge of avitaminosis is still largely limited to observations on laboratory animals, although extreme situations, such as are represented by xerophthalmia, are gradually being discovered in the study of human disorders. For the moment, some of the most critical reviewers have restricted their enthusiasms to the tentative somewhat indefinite conclusion "that vitamin A is an even more important factor in the chemistry of food and nutrition than has previously been appreciated, for it must be supplied in liberal proportion not only during growth but in the food of the adult as well, if a good condition of nutrition and a high degree of health and vigor are to be maintained." [1]

Among the difficulties encountered is the circumstance that the incipient stages of avitaminosis are not at all well defined. McLester [2] has recently asserted that the interest which vitamins hold for the physician is not alone in their relation to certain well defined diseases such as scurvy, beriberi and rickets but rather in the fact that chronic vitamin deficiency produces numerous vague, borderline states of ill health which often puzzle the physician and disable the patient. These last are of far greater importance to the physician of today than the more clearly defined deficiency diseases. From this standpoint there is added interest in studies by Thatcher and Sure [3] at the University of Arkansas. They have become interested in the early stages and the incipient signs of vitamin A deficiency. Their animal experiments lead them to conclude that pathologic changes may take place in tissues before any definite signs of external symptoms are apparent. For example, metaplastic changes in the posterior part of the tongue, in the salivary glands, and in the respiratory and urinary tracts were found during early stages of vitamin A deficiency in a large proportion of animals that made normal growth, some of which showed incipient ophthalmia or persistence of the cornified stage of estrus as the only sign of vitamin A deficiency, and others of which showed no external signs of A avitaminosis. Bronchitis and pneumonia were also found in several animals that still made slight gains in weight before the termination of the experiment. Thatcher and Sure therefore suggest that metaplasia of epithelial structures in the respiratory tract of man possibly begins before definite external symptoms are evident, which later may be responsible for the respiratory disturbances, such as are found

1. Sherman, H. C., and Smith, S. L.: The Vitamins, ed. 2, New York, Chemical Catalog Company, 1931.
2. McLester, J. S.: Nutrition and Diet in Health and Disease, ed. 2, Philadelphia, W. B. Saunders Company, 1931.
3. Thatcher, H. S., and Sure, Barnett: Avitaminosis: III. Pathologic Changes in Tissues of the Albino Rat During Early Stages of Vitamin A Deficiency, Arch. Path. **13**: 756 (May) 1932.

associated with the A avitaminosis—the common cold, bronchitis and bronchopneumonia. This is, let it be vigorously emphasized, a tentative hypothesis. It does not warrant the exploitation of common dietary sources or concentrates of vitamins as cures of colds or influenza; but these experiments represent a step in the direction of progress in elucidating what resistance and immunity may involve.

THE ALLEGED DISTRIBUTION OF INSULIN

Not long after the discovery of insulin was announced, a widespread search was begun in many laboratories to ascertain the possible distribution of this potent and remarkable hormone of the pancreas. The upshot of these investigations was the publication of numerous claims of the rather widespread distribution of substances having insulin-like action. They were reported not only for animal tissues but also for plant products of varied sorts, ranging from oatmeal to onions. These records naturally led to an intensive search for easily obtainable substitutes for pancreatic insulin, since the preparation of the latter offered difficulties and involved considerable expense. The testing of insulin calls at present for experiments on animals; in comparison with many familiar chemical test reactions, it is a more laborious and less specific procedure. The current method depends primarily on the effects of insulin in producing a prompt hypoglycemia and, if the dose is adequate, characteristic hypoglycemic convulsions. It should be noted that the reports of the insulin-like products from plant tissues indicate some difference from the insulin of animal sources in that the action of the plant substances in lowering the content of blood sugar is often not immediate but delayed for a considerable period—sometimes twelve hours or more. The occasional reports of the presence of insulin in tissues of diabetic patients have been particularly confusing.

One difficulty in all investigations in this field lies in the intricacy of the extraction methods. In summarizing the confusing situation, competent critics [1] have pointed to a number of reasons why the results of the early work on the distribution of insulin and insulin-like substances are of no significance from the quantitative point of view. It was not then fully appreciated that some test animals may show a definite fall in blood sugar over the experimental period and for this reason the results based on one animal are not satisfactory. A standard of comparison was not used in the assaying of insulin in most of the early work. In a number of the later papers that have appeared on the subject of the distribution of insulin, convincing evidence is not found that any hypoglycemia-producing substance was present in the extracts which were reported to yield positive results. When we add to these factors the possibility of the presence of a living agent which may cause hypoglycemia, the possibility that nonspecific toxic materials, which may produce liver damage and delayed hypoglycemia, may have been present, and the possibility of contamination of solutions by pancreatic insulin, it becomes apparent, the critics conclude, that the whole question of the distribution of insulin and insulin-like substances must be reopened, and that many if not all of the results obtained up to now, discarded.

Such a reinvestigation has been undertaken by one of the discoverers of insulin, Dr. C. H. Best, and his co-workers [1] at the University of Toronto. The intricate details need not be rehearsed here. Using a method of extraction which yields maximal amounts of insulin from pancreas, the Toronto physiologists have been unable to demonstrate the presence of an antidiabetic substance in other normal tissues from the dog or ox or in the tissues of diabetic dogs. After a critical appraisal of the evidence on record, Best and his associates believe that there is no evidence that any tissue other than pancreatic either produces or stores insulin.

1. Best, C. H.; Jephcott, C. M., and Scott, D. A.: Insulin in Tissues Other Than the Pancreas, Am. J. Physiol. **100**: 285 (April) 1932.

SLEEP AND THE BRAIN CORTEX

In an exhaustive review of sleep, a subject that concerns the physician as well as the layman in many ways, Kleitman [1] of the University of Chicago remarked that the problem has yet to be solved. There is no authority but that of facts, and until isolated observations have been repeatedly confirmed they cannot be classed as established facts. We are so commonly accustomed to think of sleep as part of the physiology of the brain that we may fail to consider to what extent other parts of the body or their functions may be responsible for, or involved in, the more or less complete unconsciousness under discussion. Is the cerebral cortex an essential factor in sleep? In attempting to answer this important query, physiologists have been reminded of the published records indicating that decorticated animals can sleep. This was true, for example, in the classic observations of Goltz in 1892. He reported that dogs deprived of their cerebral cortex exhibited phenomena of sleep.

In this connection the distinctions that have been stressed by Szymanski [2] in interpreting the phenomena of unconsciousness may be recalled. He demonstrated conclusively that some animals have one long period of rest in twenty-four hours and that others have several such periods. He termed them monophasic and polyphasic animals. The polyphasic are the "lower" animals, which make little use of their distance receptors for obtaining information about what is going on around them. Szymanski points out, however, that even among the monophasic animals, including man,

1. Kleitman, Nathaniel: Sleep, Physiol. Rev. **9**: 624 (Oct.) 1929.
2. Szymanski: Arch. f. d. ges. Physiol. **171**: 324, **172**: 424, 430, 1918; Ztschr. f. allg. Physiol. **18**: 105, 1920.

the young are polyphasic. In the case of adult man, interest centers in the monophasic manifestation often referred to as diurnal sleep, represented by the characteristic prolonged periods of unconsciousness and comparative inactivity. Dogs exhibit the same phenomena.

In a reinvestigation of the possible existence and localization of a sleep center, Kleitman and Camille [3] of the University of Chicago Department of Physiology have observed that decorticated dogs have several periods of sleep alternating with periods of activity each twenty-four hours. Their activity consists of almost incessant walking in circles. The most constantly occurring period of sleep follows shortly on feeding. The conclusion is made that diurnal sleep in dogs depends on the presence of the cerebral cortex for its establishment and persistence. In other words, normal dogs can stay up all day and then sleep through the night, whereas decorticated dogs have half a dozen periods of sleep in twenty-four hours.

The Chicago physiologists accordingly believe that there is no conflict between the subcortical and the cortical theories of sleep. The first account for sleep in general, the second for the special diurnal type of sleep seen only in higher animals and in man. As Kleitman and Camille point out, diurnal sleep, developed around the twenty-four hour cycle of day and night, is thus a definitely cortical phenomenon, has its center or is localized in the cerebral cortex, and disappears when the cortex is removed. That explains, they add, why all those who study the sleep of higher animals and man cannot help but see the tremendous influence of cortical processes, habits and conditioned reflexes on the onset of sleep. In man the habit of going to bed at certain hours, and of waking up at a definite time each morning, is not inborn but acquired by experience. That the subcortical sleep tendencies are ever ready to exert their action is demonstrated by the fact that most people can fall asleep not only at their habitual bedtime but at almost any time, if a condition is brought about wherein the number of afferent impulses reaching the cerebral cortex is greatly reduced. After a meal the primordial tendency to sleep is especially powerful and asserts itself with great ease, if permitted to do so. As Kleitman has elsewhere pointed out, practically we are born into a social organization in which diurnal sleep is the universally accepted mode of sleeping. The new-born baby is a truly polyphasic creature, to use Szymanski's classification. The first habit the mother tries to develop in a baby is that of an unbroken night's sleep. As he gets older, other functions develop a periodicity that coincides with the enforced sleep periodicity. For instance, a temperature curve develops, with a minimum at night, and produces a disinclination to night activity. Even the modest tear apparatus stops its function at bedtime, producing dry eyes and favoring their closure. Attempts to influence or induce sleep may well be based on some of the fundamental facts now on record.

3. Kleitman, N., and Camille, N.: Studies on the Physiology of Sleep: VI. The Behavior of Decorticated Dogs, Am. J. Physiol. **100**: 474 (May) 1932.

Current Comment

INCREASING RATES OF GROWTH

The rapid development of the science of nutrition during the past three decades has been due, in no small measure, to the ready adaptability of the white rat to the experimental conditions required in investigations in this field. The details of its reproduction and life history, the physical measurements of the organs and systems, the rate of development and the nutritive requirements of this animal, have been studied intensively; the completeness of the pertinent data render the white rat a surprisingly well standardized piece of "apparatus" available for studies in nutrition. It has been observed during the past twenty-five years that the rate of growth of the species has increased considerably. Whereas the average weight of males at 100 days of age was 165 Gm. in 1906, the value for a large number of individuals of the same sex and age was 315 Gm. in 1928. An account of the most rapid rate of growth thus far observed in this species has recently been reported by Anderson and Smith.[1] With a group of twenty-one animals the average time required for increase in body weight from 60 to 200 Gm. was 23.3 days and from 60 to 300 Gm. 41.1 days. It is emphasized by the Yale investigators that there is nothing unique about their animals from the point of view of heredity but that the rapid growth was brought about by providing a favorable diet. The food given was a mixed ration containing liberal allowances of protein, vitamins and inorganic salts. These studies indicate that thus far the growth-limiting factor in the development of the laboratory white rat has been the nutritive environment rather than the growth impulse that is presumably characteristic of the species. The animals that have shown this extremely rapid growth are not abnormal; this is indicated by previous studies [2] in which it was shown that mature individuals of the same size have identical body measurements and proportions, regardless of the rate at which they grew. That this phenomenon of increasing rate of growth is being observed in certain groups of human subjects is evident from the literature on the subject during the past twenty-five years. One of the most striking accounts of increased size is that of Gray,[3] who described a group of private school boys which showed a rate of growth consistently greater than is found in the average individual of the same age. It would appear possible, therefore, to accelerate still further the rate of development in certain species. The question as to whether or not maximum growth is also optimal has been raised by Smith,[4] who points out that "the law

1. Anderson, W. E., and Smith, A. H.: Am. J. Physiol. **100**: 511, 1932.
2. Outhouse, J. P., and Mendel, L. B.: Abstr. Div. Biol. Chem., Am. Chem. Soc., eighty-second meeting, 1931.
3. Gray, Horace; and Nicholson, S. T.: The Tallest American Boys, J. A. M. A. **88**: 2022 (June 25) 1927.
4. Smith, A. H.: Yale J. Biol. & Med. **4**: 551 (March) 1932.

of diminishing returns undoubtedly is operative in animal and plant economy as well as elsewhere." Certainly the study of geology and of biology emphasizes the futility of mere great size. However, it cannot be disputed that the race has been greatly benefited by the application of just such nutritive principles as have first been shown to be of advantage in the development of experimental animals.

Association News

MEDICAL BROADCAST FOR THE WEEK

American Medical Association Health Talks

The American Medical Association broadcasts on Monday and Wednesday from 1:30 to 1:35 p. m. over Station WBBM (770 kilocycles, or 389.4 meters). The Columbia chain program has been discontinued for the present.

The program for the week is as follows:

June 27. Hot Weather.
June 29. Independence Day Indiscretions.

There is also a fifteen minute talk sponsored by the Association on Saturday morning from 11:15 to 11:30 over Station WBBM.

The program for the week is as follows:

July 2. July Fourth Follies.

This schedule is based on Chicago Daylight Saving Time, one hour faster than Central Standard Time, and is subject to change during the summer.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

COLORADO

Society News.—The Crowley County Medical Society was addressed in Ordway, May 10, by Dr. Earnest O. McCleary on "Puerperal Eclampsia." Dr. William M. Desmond reported a case of "Carcinoma of the Tongue."——At the meeting of the Las Animas County Medical Society, May 6, Dr. Walter L. Newburn, Trinidad, read a paper on "Cholecystitis and Cholelithiasis."——Dr. Johnson E. Naugle addressed the Northeast Colorado Medical Society in Sterling, April 14, on "The Böhler Treatment of Fractures." The society was addressed, May 12, by Drs. John S. Chase, Jr., and Arnold Minnig, Denver, on "Diagnosis and Treatment of Squint" and "Nonsurgical Treatment of Goiter," respectively.——"Spinal Anesthesia" was the topic discussed by Dr. George E. Rice, Pueblo, before the Otero County Medical Society, April 14.——The Pueblo County Medical Society was addressed, May 17, by Drs. Clarence E. Earnest and Harvey S. Rusk on sinus disease.

CONNECTICUT

Hospital News.—The Arnold Pavilion for Children at St. Luke's Convalescent Hospital, Greenwich, was dedicated, May 21. The pavilion is two stories high and will provide for about fifty children. It was the gift of Mrs. Harriet M. Arnold, in memory of her husband, Hicks Arnold.

New Health Officers. — Connecticut *Health Bulletin* announces the following recent changes among health officers: Dr. John R. Tarrant as health officer of Portland, succeeding Dr. Donald J. MacGillivray; Dr. Theodore F. Foster, health officer of West Hartford, and James J. Charron, health officer of Putnam. West Hartford recently voted to operate its health department on a full time basis.

Regulation for Bathing Establishments. — The Public Health Council, state department of health, at its meeting, April 21, approved the adoption of a new sanitary code regulation for bathing establishments, effective June 1. The regulation will govern management of the grounds and appurtenances of any bathing establishment on or near any stream, natural or artificial pond, or tidal water where bath houses for the use of the public are maintained either free or for hire.

Memorial Pavilion Opened.—The Sarah Wey Tompkins Memorial Pavilion, with 139 beds for surgical and obstetric patients, was officially opened, June 18, at the New Haven Hospital. Funds for the pavilion were provided in a bequest to Yale University, by Mrs. Sarah Wey Tompkins, whose father, Dr. William C. Wey, practiced for half a century in Elmira, N. Y. Completion of the memorial increases the capacity of New Haven Hospital to 514 beds and 42 bassinets. The new six-story wing conforms in style to the architecture of the other buildings. Half of the beds are in single rooms, and the largest ward has eight beds. With the completion of the Tompkins Memorial, all of the outpatient and inpatient service of the New Haven Hospital will be concentrated in the same set of buildings adjoining the Yale University School of Medicine. In the gradual replacement of old buildings at the New Haven Hospital, the completed structures have cost more than $4,000,000.

DISTRICT OF COLUMBIA

Personal.—Capt. William H. Bell, medical officer in command of the Naval Medical School, Washington, D. C., was an official delegate to the second session of lectures of the International Bureau of Documentation on Military Medicine, Liége, Belgium, June 23-25.——Dr. Arthur C. Christie, Washington, past president of the Medical Society of the District of Columbia, was elected president of the Washington Rotary Club at its annual meeting, May 25.

District Bills in Congress.—S. 1307 has been reported to the House, without amendment, authorizing an appropriation for the alteration and repair of the buildings of Eastern Dispensary and Casualty Hospital. H. R. 11638 has been passed by the House, amending the license fees law of the District of Columbia. Paragraph 8 of the bill provides: "Apothecaries or druggists shall pay a license fee of $12 per annum. Every person who sells patent medicines, or manufactures, compounds, sells or dispenses medicines by prescription or otherwise from a located place of business shall be regarded as an apothecary or druggist."

Honorary Degrees Conferred.—The honorary degree of doctor of science was conferred by George Washington University on Dr. Frederick Parker Gay, professor of bacteriology, Columbia University College of Physicians and Surgeons, June 15, at the commencement exercises. Similar degrees were conferred on Dr. G. Canby Robinson, dean, New York-Cornell Medical Center, and Dr. Alan Mason Chesney, dean and associate professor of medicine, Johns Hopkins University School of Medicine. Because of the emphasis which the university has placed on the further upbuilding of its school of medicine in the past year, the commencement exercises centered about medical education. Dr. Gay delivered the commencement address, on "Significance of Science in Medicine."

ILLINOIS

Typhoid Fever in Springfield.—Four typhoid carriers were detected recently, when the development of sixteen cases of typhoid in Springfield led to a search for carriers among milk handlers and certain food handlers of the city. Two of the carriers were employed by the same milk dealer, one being a butter wrapper and the other an ice cream dispenser. Another made ice cream, which he sold from his own stand, while the fourth carrier delivered milk from a wagon. The state health department believes that the discovery of these carriers solves the outbreak, as no new cases have developed.

Chicago

Society News.—Dr. Austin A. Hayden became president-elect of the Chicago Medical Society at a meeting, June 14, and Dr. Charles H. Phifer was reelected secretary. At the annual dinner, June 15, Dr. Herman L. Kretschmer was installed as president of the society, succeeding Dr. John R. Harger.

Personal.—The Cross of a Chevalier of the Order of the Crown of Italy was conferred on Dr. Louis D. Moorhead, dean and professor of surgery, Loyola University School of Medicine, June 13. The decoration was conferred by Giuseppe Castruccio, Italian consul general in Chicago.——Dr. Earl B. Ritchie has resigned as assistant professor of dermatology at the Graduate School of Medicine of the Division of Biological Sciences, University of Chicago.

The Annual Rush Banquet.—Seven members of the class of 1882 were guests of honor at the annual alumni banquet of Rush Medical College, June 14. They were Drs. Malcolm L. Harris, Chicago, Past President, American Medical Association; John M. Dodson, formerly Director, Bureau of Public Health and Instruction, American Medical Association; Frederick G. Stueber, Lima, Ohio; John C. Wright, Antigo, Wis.; Elmore S. Pettyjohn, Chicago; Zalmon E. Funk, Santa Rosa, N. M., and John P. Lord, professor of orthopedic surgery, University of Nebraska College of Medicine, Omaha. Replies were received from nineteen other members of the class who were unable to attend. Of the 181 members of the class of 1882, 49 are known to be living; 85 are dead, and the remainder are at addresses unknown. Dr. Dodson gave the Alumni Memorial Address, on "Delaskie Miller." This was a eulogy of Dr. Miller, who was professor of obstetrics at Rush from 1859 to 1899. He was also a member of the board of trustees. He established the Delaskie Miller Prize, consisting of a fitted obstetric bag, which is awarded to the student doing the best work in obstetrics and gynecology. The toastmaster at the banquet was Dr. Clifford G. Grulee. Dr. Edwin M. Miller, class of 1913, president of the association, spoke. Responses were given by Drs. Morris Fishbein, class of 1912, editor of THE JOURNAL, and Donald R. Laing, class of 1932. Speakers for Rush and for the University of Chicago were Dr. Ernest E. Irons, dean, Rush Medical College, and Frank R. Lillie, Sc.D., dean of the Division of the Biological Sciences of the university. Dr. Charles A. Parker, class of 1891, was elected president of the alumni association.

INDIANA

Society News.—Dr. Charles Kenneth Riddle, Cincinnati, addressed the Dearborn-Ohio County Medical Society, May 26, in Lawrenceburg, on diabetes.——At the May 25 meeting of the Ripley-Decatur County Medical Society in Osgood, Dr. Vincent A. La Penta, Indianapolis, spoke on "Gastric and Duodenal Ulcer."——"Skull Fracture and Brain Injuries" was the subject discussed by Drs. Jewett V. Reed and Charles F. Thompson, Indianapolis, before the Lawrence County Medical Society, Bedford, May 4.

Well Baby Clinic.—An anonymous gift of $5,500 to provide for the establishment of a well baby clinic at the University of Indiana School of Medicine, Indianapolis, was announced in newspapers, June 1. The clinic, which will be equipped and maintained at the Coleman Hospital for three years through this gift, will be connected with the department of pediatrics, of which Dr. Matthew Winters is the head. It will be open on Wednesday of each week for the examination of babies and will be available to mothers unable to pay. The purposes of the clinic are to instruct the medical school students in the care and development of normal children and to educate mothers in the care and feeding of infants. Dr. Lyman T. Meiks will be in direct charge.

IOWA

Summer Round-Up Clinics.—Immunization against diphtheria was the theme during the summer round-up of preschool children at fifteen centers, conducted by the Des Moines Parent-Teachers Association. The first injection of diphtheria toxoid was offered at each clinic with the announcement that the second dose might be obtained from the family physician or from the city health officer at a specified time. This activity is the first step in the program of a committee recently appointed by the president of the Polk County Medical Society, Dr. Simon E. Lincoln, Des Moines, to promote the plan for immunization of children against diphtheria. This committee is composed of Drs. Fred Moore, Addison C. Page and Harry E. Ransom. The second step in the immunization program will be the protection of babies in attendance at feeding clinics conducted by the Public Health Nursing Association. The bulletin of the Des Moines Academy of Medicine and the Polk County Medical Society states that diphtheria has been increasing in Polk County during the past two years.

KANSAS

Society News.—The Sedgwick County Medical Society was addressed, May 17, by Dr. Ray A. West on "Biological Tests for Pregnancy—Review of Literature and Presentation of New Technic."——The Wyandotte County Medical Society was addressed, May 17, by Drs. Tony G. Dillon and Oscar W. Davidson on hematuria and pyuria, respectively.——The May issue of the bulletin of the Sedgwick County Medical Society is called the Dorsey Honor Number in memory of the late Dr. Jacob G. Dorsey.——The Decatur-Norton Counties Medical Society was addressed, April 14, by Drs. E. F. Steichen, Lenora, on "Use of Local Anesthesia in the Reduction of Fractures"; Frank Wayne Brewster, Oberlin, "Duodenal Stasis," and Jesse S. Potekin, Hoxie, "Arthritis." Dr. Brewster presented a film on "Infections of the Hand."——Dr. Clifford L. Hooper, Dodge City, addressed the Ford County Medical Society, April 8, on "State Medicine."

MARYLAND

Personal.—Dr. William H. Welch, director emeritus of the Institute of the History of Medicine, Johns Hopkins University, Baltimore, received the honorary degree of doctor of science from New York University at its commencement, June 8.——Dr. Valcoulon L. Ellicott has been appointed deputy state health officer and full time health officer of Montgomery County, succeeding the late Dr. William T. Pratt, Rockville, effective April 15.

Investigation of Food Poisoning.—The Baltimore City Health Department recently organized a "team" to investigate cases of food poisoning. R. S. Craig, director, bureau of chemistry and food, is in charge of this group. Others on the "team" are Ferdinand A. Korf, assistant director of the bureau of chemistry and food and in charge of the food division; Dr. Ferdinand O. W. Reinhard, director, bureau of communicable diseases; Dr. William H. F. Warthen, director, bureau of child hygiene; Leroy Ewing, director, bureau of bacteriology, and H. R. Broll, chief of the division of chemistry.

Change in Service at City Hospitals.—Twenty-four hour service for the admission in the hospitals of acutely ill patients, obstetric patients and persons suffering from tuberculosis and venereal diseases will be installed in Baltimore City hospitals as soon as practicable, in accordance with the recent action of the board of supervisors of city charities, which has charge of the hospitals. Under this plan the health department will deal directly with the hospitals when seeking to have a patient admitted, instead of through the supervisors of the city charities. Requests from the department for hospitalization for tuberculous, maternity or venereal disease cases will be given priority over other cases, so far as there may be vacant and available beds at the city hospitals. It is also planned to install, as soon as possible, thirty beds for the hospitalization of patients with acute venereal diseases. Under the new arrangement, the city department of health will continue its obstetric delivery service until October, 1933, when the work will be taken over by the staff of the hospitals. These changes, which have been approved by the board of supervisors, were recommended, May 20, at a conference held by the president of the charities board, the city director of health and the superintendent of the hospitals. It is expected that the Baltimore City hospitals and the department of health will thus be brought into closer cooperation.

MASSACHUSETTS

Hospital News.—The new Winthrop Hospital, Winthrop, was to have been opened for patients about March 1. It has a bed capacity of fifty, an increase of twenty-six over the old institution housed in wooden frame buildings.

Society News.—Dr. William E. Browne, Boston, was elected president of the Massachusetts Society of Examining Physicians at its annual meeting, April 27, in Boston, and Dr. William Pearce Coues, secretary. The speakers at this meeting included Drs. George V. Foster, Pittsbugh, on "Treatment of Compound Fractures," and Henry C. Marble, "Volkmann's Contracture."——The New England Heart Association conducted a cardiac course on "Chronic Myocarditis," June 1; the participating physicians were Drs. Shields Warren, Henry A. Christian, Henry Jackson and Francis W. Palfrey.——At the annual meeting of the Worcester District Medical Society, May 11, Dr. Edwin R. Leib, Worcester, was elected president, Dr. Walter C. Seelye, Worcester, gave the annual oration, on "Congenital Pyloric Stenosis."

MICHIGAN

Home for Incurable Cancer Patients.—Mercy Hall, a free home in Detroit for incurable cancer patients too poor to pay for treatment, is now located in the thirty-room residence of the late Judge G. S. Hosmer, which has been given rent free by Miss Dorothy Brown. Opened for the first time in October, 1931 (THE JOURNAL, Nov. 14, 1931, p. 1473), Mercy Hall has cared for thirty-one cancer patients, has given five operations, and has taken charge of the burial of one patient. At present its eleven beds are occupied. The institution is operated by the Society of Perpetual Help, a group of five Detroit women, with no remuneration. It is one of three

organized for the same purpose in the United States, it is reported. Dr. Louis J. Morand is president of the corporation and head of the medical staff. Mercy Hall was open to public inspection, June 5. Previously it occupied quarters in a twelve-room house at 312 Watson Street. It is understood that Detroit physicians have volunteered their services to this enterprise, through the Commission for Cancer Control of the Detroit Board of Health and the corresponding committee of the Wayne County Medical Society.

MINNESOTA

Dr. Buie Awarded Medal.—The Southern Minnesota Medical Society presented its gold medal to Dr. Louis Arthur Buie, associate professor of proctology, University of Minnesota, Graduate School of Medicine, Rochester, May 25, for research in the treatment of intestinal disorders. The medal, which is awarded annually, was presented at the closing session of the Minnesota State Medical Association.

Schuster Tries Another State.—George Schuster pleaded guilty, May 9, to practicing healing without a basic science certificate in Minneapolis and was fined $100. He paid the fine. The state board reported that Schuster admitted that he had been convicted twice previously of practicing medicine without a license: in 1921 at Youngstown, Ohio, and, in 1928, at Chicago. His illegal practice of healing in Minnesota became known following his complaint in Chicago that one William W. Blyth swindled him out of $2,050 for a fake medical license. Schuster claimed to have been ordained a German Lutheran minister in 1909 at Pittsburgh. He also claimed to be a member of a naturopathic association.

NEBRASKA

Society News.—Dr. Arthur D. Dunn, Omaha, addressed the May meeting of the Madison Six-County Medical Society, West Point, on "Relationship of Paranasal Sinusitis to Systemic Disease."——Drs. Adolph Sachs, Omaha, and Floyd S. Clarke addressed the Otoe County Professional Society, Nebraska City, May 9, on agranulocytosis and pneumonia in children, respectively.——At a meeting of the Cheyenne-Kimball-Deuel Counties Medical Society, Chappel, May 2, Drs. Charles F. Heider and Edward Stevenson, North Platte, spoke on "Diagnostic Problems in Kidney Lesions" and "Cerebrospinal Meningitis in Children," respectively.

Dr. Long Honored.—Dr. Francis A. Long, Madison, editor of the *Nebraska State Medical Journal*, was guest of honor at a dinner given by the Madison Six-County Medical Society, April 15, in Norfolk, commemorating his fiftieth year in medical practice. Dr. Benjamin F. Bailey, Lincoln, was toastmaster and the speakers were Drs. John E. Summers, John P. Lord, Albert F. Tyler and Byron B. Davis, all of Omaha; Roy B. Adams, Lincoln, and Morris Nielsen, Blair. A fountain pen desk set was presented to Dr. Long. A native of Pennsylvania, Dr. Long moved west with his parents when he was 18 years old and was graduated from the Medical Department of the University of Iowa in 1882, settling in Madison shortly afterward. Dr. Long was one of the founders of the Elkhorn Valley Medical Society and served as its third president. In 1906-1907 he was president of the Nebraska State Medical Association. He first advocated the creation of a state journal. He has served continuously since 1916 as chairman of the publication board and has been editor since 1920.

NEW JERSEY

Annual Clinics.—The staff of Hackensack Hospital, Hackensack, presented its third annual program of clinics for physicians, May 23-27. Demonstrations were held in pediatrics, fractures and orthopedics, otolaryngology, obstetrics, gynecology, medicine, surgery, dentistry and laboratory methods. Dr. Harrison B. Wilson was chairman of the demonstration committee, which included also Drs. Howard M. Meyer and Spencer T. Snedecor and Miss Mary Stone Conklin, superintendent of the hospital.

NEW YORK

Study of Health Habits.—A state-wide study of the health habits of 3,500 school children has been made during the current school year under the supervision of the health and physical education division of the state education department for the purpose of obtaining information to be used as a basis for a new state guide in health teaching for the kindergarten and first six grades. The department prepared a check list of 600 questions covering all phases of health behavior of children in and out of school. Seventeen hundred teachers in fifty-four communities were asked to select two children for observation during school hours for six weeks. The study was then carried into the homes in order to have a twenty-four hour record of the children's health habits. The entire study was to be made without the children's knowledge. The data for about 3,500 children have now been turned in to the state department for analysis, after which the returns will be used in setting up objectives for health education.

Society News.—Dr. George M. MacKenzie, Cooperstown, was elected president of the New York State Association of Public Health Laboratories at the annual session, May 23.——Drs. Thomas I. Tyrell and Harold P. McGan addressed the Medical Society of the County of Albany, June 10, on "Fractures of the Skull and Newer Methods of Treatment" and "Medical Aspects of Dysmenorrhea," respectively.——Dr. Charles H. Mayo, Rochester, Minn., addressed a joint meeting of the Broome County Medical Society, the Binghamton Academy of Medicine and the Binghamton Dental Society, in Binghamton, June 17, on infections with special reference to focal types and on elective localization and mutation of bacteria.——Drs. Thomas Ordway and Don Morse Griswold, both of Albany, addressed the Schoharie County Medical Society, Middleburg, May 2, on "Diagnosis and Treatment of Pneumonia" and "Medical Ethics," respectively.——Dr. Alvan L. Barach, New York, gave an address on the therapeutic use of oxygen in cardiorespiratory diseases before the Sullivan County Medical Society in Liberty, May 11.

New York City

Hospital News.—The fortieth anniversary of the incorporation of the Jamaica Hospital was observed with a dinner dance, April 13, at the Waldorf-Astoria Hotel.——Irvington House, a convalescent home for children with heart disease, with a capacity of 150 beds, was dedicated, May 25, at Irvington-on-Hudson. It is said to be the fifth convalescent home in the metropolitan area.——The marine roof on the new wing of the New York Postgraduate Medical School and Hospital was opened, May 26.——A clinic for the treatment of children injured at birth has been opened at the Neurological Institute, Columbia University Medical Center, under the direction of Dr. Earl R. Carlson.

New Hospital.—The new nine-story building of the Bronx Hospital, completed in 1930 and unoccupied since that time because of financial difficulties, was opened, June 12. The building, which has a capacity of 310 beds, represents an investment of $2,500,000. One floor is devoted to private rooms, another to semiprivate rooms and one to rooms for children. There are no large wards, but ward patients are cared for in small units, their beds separated by curtains. The hospital has five operating rooms, five laboratories and a research laboratory for general investigative work. The old hospital building, directly across Fulton Street, will be used as a dispensary.

Prizes to Medical Graduates.—Two members of the graduating class and one graduate of 1920 were awarded prizes for meritorious work in medicine at the annual commencement of Columbia University College of Physicians and Surgeons. Robert Lloyd Windsor won the Thomas F. Cock Prize, the annual income from a fund of $1,000, for a thesis on puerperal fever. Henry Scott Waters was awarded the Dr. William Perry Watson Prize in Pediatrics, the annual income from a fund of $5,000, for notable work in the study of diseases of infants and children. Dr. Raphael Kurzrok, a 1920 graduate of Columbia, was awarded the Joseph Mather Smith Prize, the annual income from a fund of $3,500, for achievements in the application of biochemistry to the problems of sterility.

NORTH CAROLINA

University News.—Dr. Ralph Pemberton, Philadelphia, gave a clinic on arthritis at the Duke Hospital of Duke University School of Medicine, Durham, April 8. A clinic on cancer was conducted at the hospital, April 15, by Dr. Warren H. Lewis, Carnegie Institution of Washington, Washington, D. C. Dr. Ernest W. Goodpasture, Nashville, Tenn., lectured at the hospital, April 22, on "Cytotropic Viruses."

OHIO

Personal.—The University of Cincinnati at its fifty-fourth annual commencement, June 11, conferred the honorary degree of doctor of laws on Dr. George J. Heuer, who recently resigned as Holmes professor of surgery in the college of medicine to become surgeon-in-chief of the New York Hospital and professor of surgery at Cornell University School of Medicine, New York (THE JOURNAL, Feb. 21, 1931, p. 621). Dr.

Johnson McGuire, instructor in the college of medicine, has been appointed assistant professor of medicine, effective July 1. ——Dr. Morris C. Tarr, who has practiced medicine fifty years in Wellsville, was the guest of honor at a banquet sponsored by the Kiwanis Club of Wellsville, May 12. A gold watch was given to Dr. Tarr.

PENNSYLVANIA

Society News.—Drs. Herbert G. Wertheimer and Andrew P. D'Zmura, among others, addressed the Allegheny County Medical Society, Pittsburgh, at the final meeting of the season, June 21, on treatment of erysipelas and the clinical value of electrocardiography, respectively.

Five Chiropractors Convicted.—Five chiropractors of Harrisburg were convicted in the Dauphin County Court, June 2, of practicing medicine without a license. Fines were imposed and all were placed on probation for three years. Robert W. White was fined $250 and costs and the remaining four were fined $100 each after pleading nolle contendere. The latter were W. Ray Burns, Howard A. Von Neida, O. D. Shankland and Henry Wohlgemuth. Hon. Robert R. Lewis, Coudersport, was the presiding judge.

Philadelphia

University News. — Dr. John M. T. Finney, Baltimore, delivered the commencement address at the Woman's Medical College of Pennsylvania, June 8. Dr. Elise S. L'Esperance, New York, addressed the alumnae association, June 7, on "The Relation of Tuberculosis to Hodgkin's Disease." Dr. Catharine MacFarlane, Philadelphia, became president of the association and Dr. Mary Bickings Thornton, Philadelphia, president-elect.

Society News.—Drs. Frederic Maurice McPhedran, Philadelphia, and James J. Reilly, Camden, N. J., among others, addressed the Philadelphia Pediatric Society, June 14, on "Artificial Pneumothorax in the Childhood Types of Tuberculosis" and "Still's Disease," respectively.——Dr. Walter S. Cornell, medical director of the Philadelphia public schools, has been chosen president-elect of the Philadelphia County Medical Society. Dr. Charles F. Nassau now is the president.

Personal. — The honorary degree of doctor of laws was conferred on Dr. William N. Parkinson, dean of Temple University School of Medicine, at the annual commencement of Villanova College, Villanova, Pa. —— Dr. Paul J. Pontius received the honorary degree of doctor of science at the commencement exercises of Bucknell College, Lewisburg, Pa., June 6.—The honorary degree of doctor of laws was conferred on Dr. William Wayne Babcock at the commencement exercises of Temple University.——Dr. Samuel Horton Brown has been appointed a member of the State Council for the Blind by Governor Pinchot.

RHODE ISLAND

State Medical Election.—Dr. Charles S. Christie, West Warwick, was named president-elect of the Rhode Island Medical Society at the annual meeting, June 2, and Dr. Norman D. Harvey, Providence, became president. Dr. James W. Leech, Providence, was reelected secretary.

TENNESSEE

Society News.—Drs. Virgil E. Simpson, Louisville, Ky., and Milton A. Gilmore, Hopkinsville, Ky., addressed the Montgomery County Medical Society, Clarksville, at a meeting, May 18, at which physicians of Christian and Todd counties (Kentucky) were guests.——Dr. Oval N. Bryan, Nashville, was elected president of the Middle Tennessee Medical Association at a meeting in Sparta, May 5-6.——Dr. William Oscar Baird, Henderson, was elected president of the West Tennessee Medical and Surgical Association at the recent annual meeting in Jackson. Dr. Isaac A. McSwain, Paris, secretary for more than forty years, was reelected.

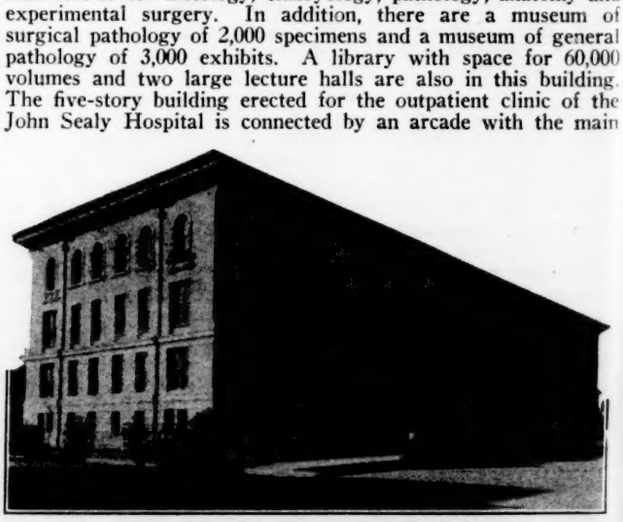
Health at Memphis.—Telegraphic reports to the U. S. Department of Commerce from eighty-five cities with a total population of 37 million, for the week ended June 11, indicate that the highest mortality rate (18.1) appears for Memphis and the rate for the group of cities as a whole, 10.8. The mortality rate for Memphis for the corresponding week last year was 13.3 and for the group of cities, 10.7. The annual rate for the eighty-five cities was 12.2 for the twenty-three weeks of 1932 as against a rate of 13.1 for the corresponding period of 1931. Caution should be used in the interpretation of weekly figures, as they fluctuate widely. The fact that some cities are hospital centers for large areas outside the city limits or that they have large Negro populations may tend to increase the death rate.

TEXAS

New Medical Buildings at the University.—Three new buildings were dedicated at the University of Texas School of Medicine, Galveston, May 30-31, in connection with the annual graduating exercises. The buildings, which are a medical laboratory, the John Sealy Hospital Outpatient Building and the Rebecca Sealy Residence for Nurses, were erected by the board of regents of the university and the trustees of the Sealy and Smith Foundation at a cost of about $2,500,000. The first day was devoted to clinics and scientific addresses with the following guest lecturers, among others: Drs. Oscar H. Plant, Iowa City; Edward H. Cary, Dallas; Dean Lewis, Baltimore; Rudolph Matas, New Orleans; John H. Foster, Houston;

John Sealy Hospital Outpatient Building.

Lewellys F. Barker, Baltimore, and Marvin L. Graves, Houston. Dr. Louis B. Wilson, Rochester, Minn., made the dedicatory address at ceremonies in the morning of May 31, and Dr. Barker delivered the commencement address in the evening. The new laboratory building has four floors. It contains laboratories for histology, embryology, pathology, anatomy and experimental surgery. In addition, there are a museum of surgical pathology of 2,000 specimens and a museum of general pathology of 3,000 exhibits. A library with space for 60,000 volumes and two large lecture halls are also in this building. The five-story building erected for the outpatient clinic of the John Sealy Hospital is connected by an arcade with the main



Medical Laboratory Building.

hospital building. Administrative offices are on the first floor, and the second is given over to x-ray equipment and to surgery. On the third are laboratories for basal metabolism and electrocardiography and clinics for ophthalmology, otolaryngology, obstetrics and gynecology. Laboratories, amphitheaters and the mortuary room occupy the fourth floor, and the fifth is used for animal houses, supplies and storage of x-ray films. The nurses' residence has rooms for 165 nurses, an auditorium seating 250 persons and a number of classrooms.

WASHINGTON

Society News.—At the final meeting of the season, speakers before the King County Medical Society were Drs. William B. and Charles R. McCreery, Tacoma, on "The Surgical Attitude Toward the Liver and Gallbladder in 1932"; Sieg-

fried F. Herrmann, Tacoma, "Newer Values in the Application of the Biopsy," and Darrell G. Leavitt, Seattle, "Treatment of Simultaneous Fractures of Tibia and Fibula." Dr. George W. Freeman, Seattle, reported a case of celiac disease.

GENERAL

Surgical Journal for the South.—A new quarterly journal entitled the *Southern Surgeon* was launched in April as the official organ of the Southeastern Surgical Congress. It will be devoted for the present to the publication of papers presented at the annual meetings of the congress. Dr. Launcelot Minor Blackford, Atlanta, is editor and the following surgeons make up the editorial board: Drs. Frank K. Boland, Edgar G. Ballenger and Charles W. Roberts, Atlanta; Hubert A. Royster, Raleigh, N. C.; Willis C. Campbell, Memphis; Rudolph Matas and C. Jeff Miller, New Orleans; William D. Haggard, Nashville; J. Shelton Horsley, Richmond, Va.; Hugh H. Young, Baltimore, and W. W. Harper, Selma, Ala.

Medical Bills in Congress.—*Changes in Status:* S. 572, the Jones bill providing for "federal cooperation" with the several states in promoting the welfare and hygiene of mothers and children, was reached twice on the Senate calendar during the week ended June 18, but consideration of the bill was again prevented by Senator King, Utah. S. Res. 26, proposing to change the name of the Senate Committee on Pensions to the Committee on Veterans' Affairs, was debated in the Senate, June 13 and June 15, but no action was taken on the resolution. H. R. 4743 has been reported to the Senate, without amendment, providing for federal subsidies for the promotion of vocational rehabilitation of persons disabled in industry or otherwise (S. Report 821).

Special Board for Dermatology.—The American Board of Dermatology and Syphilology has recently been formed to conduct examinations and issue certificates to physicians who are considered qualified to practice as specialists in those subjects. The new board is similar to the boards previously formed for the specialties of ophthalmology, otolaryngology and obstetrics and gynecology. It has eight members, four elected from the American Dermatological Association and four from the Section on Dermatology and Syphilology of the American Medical Association. Officers are Drs. Howard Fox, New York, president; William H. Mook, St. Louis, vice president; Clarence Guy Lane, Boston, secretary, and George M. MacKee, New York, treasurer. Other members are Drs. Jay F. Schamberg, Philadelphia; Howard Morrow, San Francisco; Harold N. Cole, Cleveland, and Arthur W. Stillians, Chicago. The board expects to hold its first examinations during the coming year.

Plan Second Mental Hygiene Congress. — The second International Congress on Mental Hygiene will be held in Paris, France, in 1935, it was announced following the first annual meeting of the governing board of the International Committee for Mental Hygiene, held in New York in April. Clifford W. Beers, secretary of both the national and the international committees, is now in Europe making preliminary arrangements. Dr. William Alanson White, Washington, D. C., was elected president and the following were elected vice presidents: Drs. Charles F. Martin, Montreal, for Canada; Joseph Genil-Perrin, Paris, for France; Robert Sommer, Giessen, for Germany; Giulio C. Ferrari, Bologna, for Italy; Adolf Meyer, Baltimore, for the United States, and Sir Maurice Craig, London, for Great Britain. Thomas W. Lamont, New York, is treasurer; Dr. Clarence M. Hincks, New York and Toronto, chairman of the executive committee, and Orlando B. Willcox, New York, chairman of the finance committee.

Prevalence of Smallpox in 1931. — Although the total number of cases of smallpox reported in the United States declined from 43,694 in 1930 to 26,000 in 1931, states of the north central and western sections of the country still show a heavy incidence of the disease, according to recent statistics. At least 86 per cent, or 22,413 of the cases, occurred in nineteen states of that section. In fifteen states of the Atlantic seaboard with approximately the same population, only 1,063 cases occurred. The states in which smallpox was most prevalent, amounting to more than 1 case per thousand of population in Kansas and South Dakota, are in general those in which the value of vaccination is not recognized, while in the Eastern states vaccination is the general practice. Certain cities and towns showing high prevalence were listed in the report. In Fort Scott, Kan., 128 cases occurred, which would mean a rate of 1,188 cases per hundred thousand of population; in Helena, Ark., 85 cases, a rate of 1,035, and in Bennington, Vt., 74 cases, a rate of 998; that is, 1 out of every 100 of the population was infected during the year.

Foreign Letters

LONDON

(From Our Regular Correspondent)

May 28, 1932.

Tuberculosis and Literary Genius

The number of great writers who have suffered from tuberculosis has long been a subject of remark. Some authorities have held that the disease has an effect in promoting mental development. At the Congress of the Royal Institute of Public Health, Dr. S. Vere Pearson, physician to Mundesley Sanatorium for Tuberculosis, delivered an address on the psychology of the consumptive. Referring to such authors as Tchekov, Stevenson, Keats, Elizabeth Browning and D. H. Lawrence, he said that some people ascribed their genius to the stimulating powers of the toxins of tuberculosis. Undoubtedly a sort of restless agitation was produced in certain phases of pulmonary tuberculosis. There was also a feeling of apprehension lest life should be shortened. Both the apprehension and the restlessness might act as a stimulus to production and particularly to the production of authors, who could pursue their calling without much bodily exertion. But the reactions of well known writers to the misfortunes and inconveniences of consumption had been much exaggerated, especially in the case of Stevenson and Lawrence. Authors as much as other persons reacted much more strongly to influences of their environment than to those due to ill health. Lawrence's reactions to his early home life, his marriage, the war and other matters had a greater effect on his character and writings than all the consequences of the prolonged trouble he had with his health. Most of the well known authors who had died from consumption had not had much good treatment for it. That was largely due to their temperaments and the circumstances in which they were placed. Lawrence always resisted the receipt of proper advice from an experienced physician until shortly before his death. Of all modern writers he seemed to have understood best the connection between mental upsets and ill health. At the same time it was erroneous to ascribe much of the peculiarity of his writings to his being a sufferer from tuberculosis. Dealing with the beneficial effects of happiness on the disease, Dr. Pearson referred to the case of Mrs. Browning. In 1842 it was considered a feat for her to be able to walk across a room. Four years later she married Browning and her happy life enabled her to live until 1861. It might be said in criticism of Dr. Pearson's interesting address that he somewhat misses the point, which is not the effect which the trouble of tuberculosis has in molding the writings of authors, but that the toxins of the disease act in some way as a stimulus to the brain in the production of works of the imagination. The list of writers who have suffered from tuberculosis, some, such as Keats, the Brontës and Stevenson, supremely great, is so long as to suggest something more than coincidence.

Discussion on the Teaching of Obstetrics

In a previous letter (THE JOURNAL, April 30, p. 1577) was reported the criticism by leading teachers of medical education. They considered that the main fault was the overburdening of the curriculum. Now the question of the teaching of obstetrics has been taken up at the Royal Society of Medicine in the Section of Obstetrics and Gynaecology by well known teachers. Mr. Eardley Holland of London Hospital, in opening the discussion, referred to the report of a committee appointed in 1919 to inquire into the teaching of obstetrics and gynecology. No fault was found with the systematic teaching, but the practical instruction was condemned, chiefly owing to lack of facilities for inpatient teaching. An expansion of hospital

accommodations for maternity cases was recommended. All that the schools could hope to do was to turn out a reasonably safe practitioner of midwifery, not an obstetric specialist. It was the custom to decry systematic lectures, but he believed in their value, because a difficult subject could be obtained much more vividly than by reading a textbook. As to clinical teaching, he favored a six months course. He found students wofully ignorant of the anatomy and physiology of reproduction, and much of his time was occupied in teaching a student what he should have learned when studying anatomy and physiology. More use should be made of the phantom, on which students should practice maneuvers daily under supervision.

Mr. L. Carnac Rivett of Middlesex Hospital believed in clinical rather than systematic lectures and attached great importance to tutorial classes. Each student should be instructed not only in the actual delivery of normal cases but in all such obstetric operations as he would have to perform later in practice.

Mr. Ninian Falkiner of Rotunda Hospital, Dublin, considered two months residence in maternity hospitals necessary for students. The number of forceps deliveries at the Rotunda was not great, so that they could not teach every student to perform a forceps delivery. He desired to see the gradual development of postgraduate training in conjunction with a special degree.

Mr. W. J. H. M. Beattie of St. Bartholomew's Hospital considered the teaching of gynecology comparatively easy, but obstetrics was more difficult, chiefly because of the large number of students and the small amount of obstetric material. Tutorial and practical demonstrations should take precedence over systematic lectures. Too much attention was paid to the theoretical and academic side of teaching because of the need to pass examinations.

Presentation of Medal to Sir Charles Sherrington

At a meeting of the Section of Neurology of the Royal Society of Medicine, the Hughlings Jackson gold medal was presented to Sir Charles Sherrington. Sir James Crichton-Browne, the oldest surviving friend of Jackson, whom he first met seventy-two years ago, gave some interesting reminiscences. When in 1875 Jackson published his most important paper on temporary mental defects following the epileptic paroxysm, Sir James sent a copy to a judge who had imposed the death sentence on a man who had epilepsy. The result was that the judge intervened and saved the man's life.

Dr. T. Watts Eden, president of the society, supposed that Jackson would always be regarded as one of the greatest clinical observers the world had ever seen. Sir Charles Sherrington's observations had disclosed a domain of nerve function which was hardly dreamed of in Jackson's time.

Sir Charles Sherrington said that the gift he received in the name of the master of neurology was an encouragement which nothing could exceed. He inspired the laboratory worker as much as he did the clinician. There were enthusiasts who had time to cultivate both aspects. But for Sir Charles the laboratory had always seemed such a busy place that he could not get outside it, though never from lack of interest in what was being done elsewhere.

Financial Difficulties of Medical Socialism

The government has found it necessary to introduce a bill to insure financial stability of the national health insurance scheme. In the House of Commons the minister of health, Sir E. Hilton Young, said that no fewer than 17,000,000 persons were now insured. For the first ten or fifteen years of the twenty years' life of the scheme, its finances were prosperous and large surpluses were secured, out of which additional benefits were paid. Then came a change. Between 1921 and 1927 there was a startling increase in the sickness claims of married women —to 106 per cent above the expectation. More careful supervision of claims and better medical certification were urged, but without much effect. Then it became obvious that there was something seriously amiss with the finances of national health insurance. Claims were increasing, particularly with respect to women. On the other hand, another menace arose: Owing to the growth of unemployment, contributors were increasingly falling into arrears. Next the actuary reported that while during the period of prosperity the surplus assets of the lodges grew by no less than $125,000,000, during the subsequent period there was no real increase and "additional benefits" had to be considerably reduced. No fewer than 418 societies were faced with a deficiency, and if they could not fall back on central aid they would not be in a position to pay their minimum statutory benefits. The outlook was now critical. To go on as at present would result in a widespread deficiency among the societies. The breakdown with respect to married women was such that the sickness and disablement benefit was $20,000,000 in excess of actuarial expectation during the last valuation period. The loss in respect to married women was three and one-half times greater than in respect to single women. A government investigation led to the conclusion that the main cause of the increased claims was the number of persons who receive benefit although not incapable of work. The government proposes to reduce the disablement benefit of unmarried women from $2 to $1.25 and of married women to $1, and also to reduce the sickness benefit of married women. It has also been found necessary to curtail the extent to which persons are excused arrears of contribution because of unemployment.

PARIS

(From Our Regular Correspondent)

May 18, 1932.

Biologic Effects of Meteorological Factors

At the last Congrès national d'hygiène, it was decided to organize an official conference to study the influence of various meteorological elements on the organisms of man and animals. The program of this conference, which is to be held, July 10, at the Institut de Pasteur de Paris, has now been worked out by the organization committee and communicated to the press, in order to provoke inquiries and to stimulate, in the various countries, medical observations, which the conference will gladly accept. The program is as follows: (1) general statement of the problem; action of various meteorological factors on the organism, to be presented by Dr. Lesage, member of the Academy of Medicine, and former president of the Société de médecine publique; (2) exhibit of instruments and scientific procedures that meteorology can place at the disposal of biology, in charge of General Delcambre, inspector general of aeronautics and director of the Office national météorologique, and (3) scientific bases of statistics; exhibit of the methods that the statisticians can place at the disposal of biology, entrusted to Mr. Moine, statistician of the Comité national de défense contre la tuberculose and director of the Office national d'hygiène sociale. This first conference has for its object the establishment of a scientific basis for the researches that would bear on the following points, the results of which would be presented at a later conference: (1) influence on the healthy human organism, for example, shocks in nurslings, epidemic of Liége; (2) effects on the terrain (receptivity); (3) influence on the organism already infected (malaria, and the like); (4) influence on the progress and extension of epidemics; (5) influence on micro-organisms, and (6) influence on the means of vaccination. In each of these subjects to be considered, the investigator should give an historical account of what has been done and (2) a description of the scientific method to be adopted to serve as a basis for new researches.

Seasonal Variations in the Virulence of Poliomyelitis

Professor Levaditi of the Institut Pasteur de Paris, who took up some time ago a study of poliomyelitis and directed the inquiry into the epidemic that occurred in Alsace in 1930, has made some interesting new observations. It is well known that poliomyelitis is subject to seasonal variations that have not as yet been explained. Some investigators have invoked cosmic influences, others the electrical condition of the atmosphere, and still others changes in the virus itself. Professor Levaditi and Mr. Hornus observed, in November and December, 1931, that first an attenuation and later a veritable suppression of virulence occurred in a strain of poliomyelitic virus conserved in the laboratory by regular passages through the monkey. They sought an explanation for this phenomenon and presented later to the Academy of Medicine the conclusions that they reached. They found that this disappearance of pathogenic activity took place in vivo owing to a progressive autosterilization of the neuraxis due to a partial and probably seasonal immunity of the organism of the monkey. Comparing their observations on the periodicity, likewise seasonal, of the epidemics of poliomyelitis, they concluded that this periodicity is ascribable to variations in the resistance of the organism of the animal, as determined by its external surroundings, rather than to changes of inherent biologic properties in the microorganism. This opinion is a further elaboration of that outlined by Levaditi last year. He assumes that the poliomyelitic virus, which attacks almost exclusively young persons, finds an increasingly resistant milieu as subjects pass beyond their twentieth year of age, which enables them to play then the rôle of germ carriers. Immunity, in man as well as in the monkey, is therefore established easily, merely with advancing age.

Professor Bloodgood's Address Before the Anticancer League

The general assembly of the Ligue française contre le cancer was held in Paris, April 26, in the hall of the council of the faculty of medicine. The meeting was a formal occasion. The president of the republic and the ambassador of the United States sent representatives. Other notables present were the minister of public health, the director of the public health service, several professors of the Paris faculty of medicine, the management of the Institut Curie, and many eminent scientists. After the reading of reports of the general secretary and the treasurer, and the election of Professor Forgue of Montpellier as member of the council, the audience assembled in the Great Hall of the faculty of medicine, where Prof. Joseph Colt Bloodgood of Johns Hopkins University, Baltimore, delivered an address, with presentation of a film, on the need of the early detection and treatment of cancer. He praised the work in this field of French scientists and announced also what had been undertaken in the United States. He emphasized the importance of phenomena that, while they do not constitute cancer, may develop into cancer. For the prophylaxis of skin cancer, he recommended that, with the birth of the child, the attention of the obstetrician should be drawn to the slight anomalies; later this rôle diverts to the mothers and to the teachers. He emphasized the value of frequent examination of the buccal cavity by the stomatologist and enumerated the diseases that may originate in the mouth. He studied the rôle of roentgen rays and of radium in the treatment of malignant bone tumors and cancer of the breast, and the importance of radiography for the early detection of these tumors and of cancer of the stomach. Today, the cases in which operation is no longer practicable have been reduced to less than 50 per cent, for it is just as easy to roentgenograph the stomach as it is to examine the heart with a stethoscope, and it is easier to reach a sure diagnosis. In closing, Professor Bloodgood recommended a semiannual pelvic examination of mothers as the surest protection against cancer of the cervix or the uterus. The day following, he presented, at the Faculté de médecine, two other films used to illustrate two further lectures, one on "The Development in Vitro of Human Tumors and of Human Cancer Cells" and one on "The Radiologic Diagnosis of Bone Tumors." Professor Calmette gave a reception in Professor Bloodgood's honor at the Institut Pasteur.

The Biologic Reactions of Lying

Accounts published in the United States in regard to a recording apparatus (lie detector), designed to reveal the emotions of a defendant in a court action and to detect a lie, awakened interest in France. Dr. Laignel-Lavastine suggested, in this connection, analyses of the urine before and immediately after the examination of a witness, he having noted that the hydrogen ion concentration is modified in subjects in whom the examination had caused great emotion. Several medico-legalists, writing in the *Siècle médical,* stated that they had frequently observed that the sudden acceleration of the pulse and the sharp rise of blood pressure in a defendant when asked an unexpected and embarrassing question often coincided with a fear state, and that the outcome of the inquiry had often shown that at that moment the defendant had lied. But there are causes of error due to the condition of the defendant's heart. If the accused is much depressed, he may have a very weak pulse, which does not vary whether his statements are true or false. The variation in the hydrogen ion concentration of the urine, if collected with a sound, would give, according to Laignel-Lavastine, results less likely to be affected by other factors, a strong emotion creating immediately a state of acidosis. It appears, however, that these laboratory experiments, interesting though they may be from a psychophysiologic point of view, will be difficult to apply practically in connection with the examination of court witnesses.

Intoxication with Carbon Tetrachloride

Carbon tetrachloride has widespread medical and industrial uses. Employed by dermatologists to combat seborrhea of the scalp and seborrheic eczemas, it does not appear to have caused notable accidents. Used internally to destroy Ancylostoma, it provokes sometimes nervous or hepatic disorders. But it is chiefly when used for the extinguishing of fires that it produces the most serious accidents, several examples of which have been reported recently in various parts of France. Either by its direct action or by its decomposition into carbon oxychloride, it causes grave disorders in persons who have breathed in much of the vapors in the vicinity of a fire combated by extinguishers containing this substance. In the persons affected, one observes trembling, convulsive spasms and even tetanic attacks. In cases of inhalation, even though for only a brief interval, while the nervous signs may disappear rapidly, death may ensue within a few days, due to acute edema of the lungs, bronchial pneumonia or, particularly, hepatic lesions. The lesions found involve almost exclusively the liver; attention has been called to renal lesions in subjects probably predisposed. Dr. Mollaret of Grenoble reported a case of a fire that arose owing to a short circuit, in a poorly ventilated room, which required the use of extinguishers containing carbon tetrachloride, of which a rather large amount was employed. That evening the two men felt a slight discomfort, and the next day they presented a subicteric appearance and complained of nausea, gastric disturbances, and a profound asthenia. The symptoms remained intense for four days and then steadily diminished during the following week and ended in recovery. Drs. Hébert and Phélebon of Montrichard published their observations on an automobile chauffeur who had been cleaning for several hours the chassis of his vehicle by means of a carbon tetrachloride product used normally as a fire extinguisher. The following day, he was seized with vomiting and presented a subicteric

appearance with hepatomegalia and azotemia. A cure was effected as the result of energetic treatment. It is to be noted in this case that the intoxication was not due to the projection of carbon tetrachloride on a fire but to the inhalation of the cold product, for several hours, in a confined atmosphere. The council of health has consequently decided that cleaning operations with carbon tetrachloride should be carried on in the open air. For the extinction of fires one should, as far as possible, combine the use of carbon tetrachloride with that of other products (water extinguishers using foam or spray). When one has recourse to this method, one must beware of fires of electrical origin developing in poorly ventilated spaces; for example, in cable conduits. In that case, it is well to equip the rescuers with gas masks.

BERLIN

(From Our Regular Correspondent)

May 16, 1932.

Organization of Cancer Research

The organization of cancer research, as has already been emphasized, is at present in the forefront of interest, whereas, for a number of years previously, it had received little attention. Mention has been made of the appointment of a federal commission to supervise and aid in the organization of cancer research (THE JOURNAL, May 30, 1931, p. 1887). The council of the federal commission for cancer research met recently in Berlin, under the chairmanship of Ministerial Director Dr. Dammann, at the federal ministry of the interior. Since others besides physicians are interested in the movement to spread a knowledge of cancer, the criteria for the organization of cancer research must, in their form of expression, take account of that fact. As representing the aim of organization measures, the following criteria have been proposed: the early detection of cancer patients and examination of suspects; the rapid and sure diagnosis of cancer; the aid of cancer patients after receiving treatment. The aid of incurables must not be neglected. Success depends primarily on the cooperation of the physicians, supported by suitable auxiliary forces and the population, after it has been properly enlightened on the subject of cancer. Since, aside from occupational cancer, there is no prophylaxis against cancer in general, the aim of the publicity campaign must be to induce persons with suggestive signs to submit to an immediate and adequate medical examination. The education of the people in the hygiene of cancer must be carried on in such a manner as to counteract fear of the disease. Attention should be called to the fact that cancer, if diagnosed in time, no longer belongs to the incurable diseases. Especial significance is attached also to promulgating a better knowledge of cancer among the physicians. The most important tasks of organization rest with the state and the provincial committees. The following should take part in the work: representatives of the governments and the administrations of the provinces, of the cities and the rural communities, of the medical profession and of the faculties of medicine, the social aid agencies and the volunteer public welfare agencies.

The example of Sweden and France was called attention to by many as worthy of imitation by reason of a centralization of cancer treatment. In spite of this suggestion, however, the criteria as drawn up were based on the principle of the natural development dictated by the conditions obtaining at present in Germany. It would be virtually impossible and certainly not feasible to try to take the cancer patients away from the surgeons and gynecologists and from the smaller and middle-sized pathologic institutes directed by them, since they are in a position to treat them by purely surgical means. That is not done even in Sweden, as is known from Forsell's public statement, although Sweden is usually put forward as a prototype of centralization. The utmost endeavors must be put forth to provide institutions in which cancer patients can be treated by methods that are in accord with the present status of medical knowledge.

Especial importance attaches to the providing of sufficient funds to assure the examination of cancer suspects and the prompt and effective treatment of all cancer patients. Aside from suitable agreements between the guarantors of the cost of treatment, concerning the continuation and the avoidance of interruption of therapeutic measures already begun, the collection of a general fund was proposed in order to assure for patients of limited means who have no one to guarantee the cost of treatment an immediate examination and prompt treatment.

According to the papers of Dietrich of Tübingen and Stauder of Nuremberg, in view of the improvement in the statistics and the assurance of good results from treatment, a movement in favor of voluntary submission to examination and treatment ought to be organized by the medical profession, as has been done in some parts of the country, with suitable participation on the part of the "chambers of physicians" *(aerztekammern)*. The federal cancer commission has decided to promote this idea more vigorously through the appointment of a small committee of experts.

Are Fixed Prices for Courses of Treatment Feasible?

Like all other institutions, the mineral spring bath establishments have endeavored to accommodate themselves to economic necessities and changed conditions. On every hand, courses of treatment at fixed prices are announced. While this innovation appears to meet a present-day need, there is a possibility of the treatment becoming thereby too mechanical, and precisely in connection with treatment at mineral spring resorts evils may arise as a result of such a system. The physicians and the managements realize the dangers involved; but there is naturally enough a desire to relieve in this manner the not always unjustified fears of the patients that a course of treatment extending over several weeks may exceed the limits of their capacity to pay. One hears on every hand the complaint that spa treatment has become much more expensive. These complaints are unjustified in that it is impossible to state in advance what the exact cost of treatment will be, in view of the fact that the extent of the treatment needed becomes apparent only during the course of the treatment. Hence, many voices are raised against soliciting patronage by offering fixed prices for prolonged courses of treatment, it being alleged that it would be much better to reduce the charges for diagnostic measures and for treatments to as low a point as possible, and thus avoid unprofessional mechanization. What is true of therapeutic measures to be applied in spas and in sanatoriums is true also —allowing for slightly changed conditions—with reference to observation patients in hospitals, and particularly in private clinics. This applies to observation cases in the field of the internist, the surgeon, the urologist and others. Many a patient dreads an observation extending over several days on account of the heavy expense for special diagnostic aids, in which the roentgenologic examination is nearly always the principal component. But also chemical and physical examinations, functional tests, and the like, go to make up a sum, which, along with the regular hospital charges, is considerable, and there is a danger that little will be left to pay the physician's fees. There have been attempts to establish a fixed, previously announced price for the diagnosis of circulatory disturbances, gastro-intestinal disorders, and liver and gallbladder disease. Some of the plans that looked enticing when viewed theoretically have been found impracticable when it came to their execution. A hospital observation, with the application of modern diagnostic methods, is not usually undertaken unless a simple clinical examination fails to accomplish its purpose. If a fixed price is made, the examiner is obliged to confine himself to one organ or to one organic system. But it is well known that, not infrequently, in searching for a stomach ulcer

the examination must be extended to the gallbladder, to the large intestine, and possibly to the renal pelvis. Such an eventuality plays havoc with a fixed price agreement. It would appear, therefore, that these endeavors to give a fixed price in advance, while well meaning enough, may be regarded as mere transitory attempts to adapt oneself to the changed economic conditions that prevail.

THE UKRAINE

(From Our Regular Correspondent)

Odessa, April 28, 1932.

The Third All-Ukrainian Therapeutic Conference

The Third All-Ukrainian Therapeutic Conference was held in Kiev, Sept. 10-15, 1931. On the first day, the attention of the conference was held by Prof. M. I. Leporsky's paper on "The Pathogenesis and Treatment of Acute Joint Rheumatism." Professor Leporsky pointed out that most investigators agree on the infectious or allergic theory.

Studying basal metabolism during rheumatism, Professor Leprosky found in the daily balance a retention of water and sodium chloride without hydremia or an increase of sodium chloride in the blood, an increase in the total and residual nitrogen in the blood, and a diminution in the basal metabolism of 23 per cent on an average. Connecting these facts with Pemberton's data on the increase of blood oxygen in the course of rheumatism, Professor Leprosky concludes that there is an increase of albumin metabolism, a retention of water and a limitation of oxidative processes in the tissues. As to treatment, Professor Leporsky removes any local septic foci and prescribes Pemberton's diet. He obtained good results using this treatment.

The problem of rational nutrition was one of the topics for discussion. Dozent L. K. Korovitzky discussed pellagra. During 1929-1931 he observed about 560 cases of pellagra in South Ukraine. He makes the following conclusions: Physicians often mistake indistinct forms of pellagra for skin diseases. The early symptoms of pellagra are salivation, obstinate diarrhea and skin manifestations. From a group of Dozent Korovitzky's sixty patients, all from one city, 50 per cent never eat maize; thus it did not enter into the etiology of the disease. The principal causes of pellagra are an unbalanced diet with insufficient protein and deficiency of vitamin B_2 in the food.

Prof. V. M. Cogan-Iasni read a paper on the pituitary diseases. He demonstrated the treatment of diabetes insipidus by means of transplantation of the pituitary. Clinical observations completely confirm the rôle of the hypophysis cerebri in the regulation of water balance and pathogenesis of diabetes insipidus. The cooperation of physiologists, biochemists and clinicians is necessary in the study of hypophyseal disorders.

Among the papers not included on the program was that of Prof. X. X. Vlados of Moscow on pernicious anemia of the Biermer type, treated by the method described by W. B. Castle (*Am. J. M. Sc.* **178**:748 [Dec.] 1929). He also treated with good results pernicious anemia patients with mucin from hog stomachs.

About 400 physicians, chiefly from the Ukrainian Socialist Soviet Republic, were present at the conference. The subjects on the program of the next conference will be the problem of influenza, stomach diseases and circulatory diseases.

Prof. I. I. Fainschmidt was elected president of the organization committee from the Ukrainian Socialist Soviet Republic.

The Death of Professor Goubarev

Alexander Petrovitch Goubarev died, Oct. 23, 1931, of arteriosclerosis. He was born in 1855 in Moscow, where he graduated in 1889 from the medical faculty. In 1889 he was invited to be prosector to the chair of anatomy under Professor Zernov; at the same time he worked in the gynecologic clinic under Professor Snegirev. In 1893 he was elected professor of gynecology and obstetrics in the university of Dorpat, and in 1898 became professor in the same chair in Moscow. He was director of the gynecologic clinic of the First Moscow State University constantly until 1922, when he retired because of ill health.

Professor Goubarev has written 131 scientific works, many of which are in English, French and German. His "Operative Gynecology" and "Clinical Anatomy of Female Pelvic Organs," which he illustrated himself, received premiums. He was one of the founders and editors of the journal *Gynecology and Obstetrics*. He founded a school of Russian gynecologists and obstetricians. In 1911 he was elected Doctor of Science Honoris Causae of the Dublin University. He was an honorary member of many European and Russian gynecologic and obstetric congresses and societies.

The Treatment of Trachoma

The soviet government has begun an intensive campaign against trachoma. Of the total number of blind persons in the Soviet Union, 234,833, one fifth lost their vision because of trachoma.

For the rational treatment of trachoma, Professor Phylatov of Odessa proposes to limit the use of drugs, reducing the treatment to frequent pressing out of the granules, the operation that is acknowledged as the best method of treatment. He advises that this intervention be repeated several times at intervals of from four to six weeks. The loss of the patient's time by this operation is compensated for by abolishing medical treatment, for which frequent visits to the hospital are necessary. The effectiveness of the treatment depends on the active stimulation of the local tissue reaction. In the treatment of sixty patients in Grossliebenthal, a village near Odessa, and in Luxemburg, a village near Marieoupol, the author and his collaborators secured good results. There were no complications in more than 400 cases which did not receive any further treatment.

MADRID

(From Our Regular Correspondent)

May 2, 1932.

The International Congress of Surgery

TUMORS OF THE SPINAL CORD

During the International Congress of Surgery, recently, in Madrid, Dr. Robineau of Paris presented an article based on sixty-four operations for tumors of the spinal cord, performed by himself. Death occurred in one case following hemorrhage and in two cases from cardiac syncope eighteen and twenty hours after the operation. Tumors of the spinal cord are fatal unless surgically removed. The diagnosis should be made early. The clinical diagnosis should be confirmed by the laboratory examinations with regard to the modifications of the cerebrospinal fluid, the pressure of the cerebrospinal fluid and the radiologic examination of the subarachnoid space, after the injection of an opaque iodized oil as a contrast medium. The oil stopped by the tumor shows its outline. In the presence of such conditions as Pott's disease or some types of myelitis it is possible to make a mistaken diagnosis of tumor of the spinal cord. In certain cases it is impossible to distinguish whether or not the pathologic process is a true tumor or an inflammatory condition. In cases of doubt, it is preferable to operate. Death following the operation occurs in 5 per cent of the cases. Diffuse intramedullary tumors cannot be removed. The life of patients with diffuse glioma who have been operated on may be greatly prolonged by postoperative roentgen irradiation. Flaccid paraplegia caused by destructive medullary lesions as well as spastic paraplegia of old duration do not disappear after the operation. Tumors with extensive intramedullary ramifications cannot be totally removed, because of the danger of sacrificing essential nerve cells during the operation, and their recurrence after the opera-

tion is fatal. The operation gives satisfactory results in 60 per cent of the cases, in 50 per cent of which no functional disturbances persist after some months following the operation. Surgery of tumors of the spinal cord is one of the achievements of neurology during the last four decades.

Dr. Dominici of Rome presented statistics covering sixty-three cases of intraspinal tumors. The tumor could not either be found or reached in five patients; three patients died as a result of the operation; in the remaining fifty-three patients the cause of the spinal disturbances was intraspinal tumors, cysts, gummas or fibrous or serous meningitis. The postoperative mortality is higher for tumors located in the superior portion of the spinal cord. The diagnostic method most frequently used in Italy is the descending injection of iodized oil. Radiography is the best method to establish the diagnosis and also to locate the tumor in relation to the vertebrae. In doubtful cases Dr. Dominici resorts to exploratory laminectomy, according to Alessandri's method.

Dr. C. A. Elsberg of New York presented a study of tumors of the spinal cord with statistics on 208 cases, with a postoperative mortality of 6.9 per cent for extramedullary tumors and 1.7 per cent for extrameningeal tumors. The following results were obtained: complete recovery or considerable improvement in 63 per cent of the cases, a minimal improvement in 10 per cent and no modification of the conditions in 18 per cent; in five cases the results were not reported. The tumors were seated in the thoracic region in 51 per cent of the cases, in the cervical region in 32 per cent, and in either the sacral or the lumbar regions in 17 per cent of the cases. The tumors were intrameningeal in 72 per cent of the cases and extrameningeal in 28 per cent. The content of total globulin and protein in the cerebrospinal fluid is higher when the tumor is intradural than when it is extradural.

Dr. Mixter of Boston originated a method to prove the presence or absence of an intraspinal tumor above the operative field during the operation. As soon as the arachnoid membrane is located, the assistant makes digital compression on the veins of the neck. The absence of any pathologic lesion which may cause obstruction of the arachnoid space above the operative field is proved by the free passage of the fluid from top to bottom through the arachnoid space while the veins are under compression.

CARDIOSPASM

Dr. L. Cardenal of the Faculty of Medicine of Madrid discussed cardiospasm, which he defined as "a functional disturbance of the cardiac sphincter, during the passage of food into the stomach, followed by hypertrophy and dilatation of the esophagus, without the presence of an anatomic stenosis." The condition does not indicate a spasm but a dilatation of the esophagus, the pathogenesis of which is similar to that of congenital stenosis of the pylorus and to congenital hypertrophic dilatation of the colon. The identity in the pathogenesis of these conditions becomes evident by an interpretation of the laws of Bayliss and Starling on the mechanism of peristalsis. This may explain the production of disturbances in some other sphincters, as well as some postoperative disturbances related to the passage of food through the new anastomosis made in operations on the stomach. The esophagus is permanently separated from the stomach and opens into it, through the cardiac sphincter, only during brief periods as the result of a physiologic reflex caused by deglutition. The cardiac sphincter represents a vegetative muscle. Smooth muscles resist pressure and traction for a long time without consumption of energy. But they are not true sphincters, since Kastner defined true sphincters as muscles with tonus, which do not have various dimensions but only variations of tension, and which do not follow the laws of peristalsis given by Bayliss and Starling. The cardiac sphincter of the esophagus follows these laws. In normal conditions the cardiac sphincter is in an intermediary condition between maximal contraction and maximal dilatation. If one stimulates mechanically the wall of the pharynx, one can observe a peristaltic movement which runs the entire length of the esophagus. In the same manner, the passage of food through the pharynx causes in the esophagus a wave of dilatation, which is immediately followed by a wave of contraction. The latter, however, is more imaginary than real, since it is only the return of the esophageal segment to its original position. The active phenomenon of stimulation causes the opening of the esophageal segments that are immediately under its influence, and while this movement progresses downward, the passive phenomenon, that is, occlusion, takes place in the segments previously dilated. A peristaltic wave of opening on the epicardia permits the passage of the food, but as soon as the food passes through a given segment into another, the first epicardial muscular segment returns to its previous condition of occlusion. If one studies the blood supply of the cardiac sphincter of the esophagus during its phase of rest or occlusion, one can prove that the active phase is dilatation while the passive phase is occlusion. The blood supply of the cardiac sphincter corresponds to the minimal amount necessary for the conservation of the cells. During the spasmodic contraction an almost absolute ischemia of the contracted segment is noticeable, while the circulation is considerably increased during the phase of relaxation. The experimental ligature of the local vessels causes ischemia and prevents the opening of the cardiac sphincter. In cases with a pathologic increase of circulation (such as peritonitis or mediastinitis) the cardiac sphincter is dilated, relaxed and patent. Bayliss and Starling in 1899 established a law with regard to the peristaltic movements of the digestive tract according to which any natural stimulation on the intestinal mucosae causes at the same time dilatation of the intestinal segment immediately under the influence of the stimulus and contraction above it. According to the law of Bayliss the dilatation (which starts immediately below the stimulated point and follows in a movement of propagation downward all through the digestive tract) is not a relaxation caused by inhibitive impulses but a manifestation of activity of all the vascular and muscular cells of the intestinal mucosae. The following contraction is only the return to a condition of rest of the segments.

SURGERY OF THE ESOPHAGUS

Dr. Gregoire, of the Faculty of Medicine of Paris, stated that the progress of surgery depends on advances made in the examination of the patient, in pathology, and in the treatment of cases. From these points of view, surgery of the esophagus has made great progress in the last few years. Roentgen examination of the esophagus and endoscopy are of great value and by these methods intra-esophageal treatment has brought good results. The pathology of ulcer, diverticula and idiopathic dilatation of the esophagus has advanced. A more precise operative technic has been developed to approach the mediastinal esophagus, especially at the level of its inferior segment. By the use of extraserous methods, the dangers of the infection of the pleura and of the peritoneum have been avoided.

Dr. J. L. Faure of Paris stated that, although he performed two operations with resection of the thoracic segment of the esophagus thirty years ago, at present he has supplanted the operation by roentgen therapy.

Dr. Sauerbruch of Berlin said that he has successfully operated in four cases of esophageal diverticula opened into the bronchi; he performed esophagogastric anastomosis in twelve cases without having had a death; in two cases of cancer of the esophagus invaginated into the cardiac sphincter, he succeeded in resecting the pathologic segment in a one-stage operation.

PROGRESS IN SURGICAL ANESTHESIA

Dr. Monod of Paris said that rectal anesthesia should be resorted to only in exceptional cases, because the absorption

through the intestine is irregular and the anesthesia cannot be controlled. Anesthesia with tribrom-ethanol is pleasantly mild and patients prefer it to spinal anesthesia. Ether anesthesia given as a mixture of ether in oil is less dangerous than tribrom-ethanol anesthesia and the dose of the anesthetic does not have to be repeated. Ether has a less irritative action on the rectum than tribrom-ethanol, and its anesthetic effect is more prolonged. The principal indications of ether anesthesia are for operations on the thorax, the neck and the head. The toxicity of tribrom-ethanol limits its use. It is especially of value in operations performed on weak persons and in operations of long duration; its use is not followed by any disturbances that usually follow any other anesthetic by inhalation. Theoretically, tribrom-ethanol is not the best anesthetic for the following reasons: It demands the constant supervision of an expert anesthetist during the operation; the anesthetic effects are rapid; the enema should be given at a temperature not higher than 40 C. (104 F.), since when it is given at a higher temperature it becomes irritative to the rectal mucosae and may cause necrotic colitis. The sensitiveness of the respiratory center to tribrom-ethanol is even greater than to chloroform, and tribrom-ethanol depresses the blood pressure. An excessive dose of tribrom-ethanol is dangerous. Killian in 1927 reported 33 deaths among 3,646 operations made under tribrom-ethanol anesthesia. Sixteen out of the thirty-three deaths were undoubtedly caused by the anesthetic. By improvements in the technic, better results have been reported from Germany among 400 operations done under tribrom-ethanol anesthesia. Lundy believes that the mortality rate from tribrom-ethanol anesthesia is 3 per thousand, while Sprecht believes it is 1 per thousand. The dose of tribrom-ethanol is 0.1 Gm. per kilogram of body weight. Then the solution should be diluted in water distilled twice in a proportion of 2.5 per cent; that is, 6 Gm. of tribrom-ethanol and 240 cc. of water distilled twice. The solution is made up in an Erlenmeyer's flask to a temperature of 40 C. Great care should be taken not to exceed this temperature. The solution is shaken in the bottle during five minutes and it is prepared in the same manner in which arsphenamine is prepared; that is, at the time that it is going to be used. Before the injection is given, 5 cc. of the solution is poured into a test tube to which a drop or two of a 1 per cent solution of congo red is added. The color given by this mixture should be a clear orange red. If the mixture has a bluish hue it should not be used because it is dangerous. The enema is given by using a catheter with a diaphragm in order to avoid escape of the anesthetic. After the solution has been injected, the catheter is closed with a hemostat and left in the rectum for fifteen or twenty-five minutes, until the effects of the anesthesia begin to appear.

Dr. Goyanes of Madrid spoke on arterial anesthesia by injecting inside of the arteries a 0.5 per thousand solution of procaine hydrochloride. By this method, operations in the area supplied by the arteries injected can be made without any pain. The principal indications of this method are operations in the left arm. The effect of the anesthetic lasts all the time during which ischemia is present.

Superior Board on Psychiatrics

The department of the interior has nominated several psychiatrists to form a superior board on psychiatrics, with Dr. G. Lafora as president. The duties of the board will be to act as consultants and inspectors of psychiatric dispensaries and to promote their establishment; to collaborate with architects appointed to erect psychiatric hospitals; to attend to the prevention of mental disease and to the care of psychiatric patients, and to modernize psychiatric hospitals. The superior board on psychiatrics requested the government to provide the provinces with two different types of psychiatric hospitals: small hospitals of about 150 or 200 bed capacity, built in the city, in which patients with a recent development of the disease may be attended, and larger hospitals, built in rural areas, which may serve as interprovincial or regional psychiatric hospitals, to which patients with mental diseases who have been attended for more than one year in the small hospitals may be transferred. The authorities of Galicia decided to carry on this project. The members of the superior board on psychiatrics requested from the ministry of public education the creation of a chair of psychiatrics in the several schools of medicine in order that the personnel in charge of psychiatric hospitals may be selected from specialists who have attended those courses. The board will also select the nurses. Through the efforts of the board, a society for the guardianship of psychiatric patients has been organized. Members of this society are well known laymen who will help the board by taking charge of certain chronic patients who are not dangerous; they will help them to live in better conditions to bring about their social adjustment by placing them or helping to support them as guests of families who live near the psychiatric hospitals. In some Spanish hospitals it has been estimated that 60 per cent of the psychiatric patients develop tuberculosis in about six months after admittance.

Eightieth Birthday of Ramon y Cajal

The histologist S. Ramon y Cajal has passed his eightieth birthday. Besides the studies made on histology, Ramon y Cajal founded a school of research on the histology of the nervous system. The anniversary of Ramon y Cajal passed unobserved by his pupils and friends and it appeared only among the news of some daily papers. When Ramon y Cajal was 70 years old, a bust of him was unveiled. Some politicians at that time grasped the opportunity to make a hostile manifestation against the government, which manifestation failed through the efforts of Ramon y Cajal. Those friends who heartily greeted Ramon y Cajal on his seventieth anniversary failed to remember his eightieth anniversary. Dr. Ramon y Cajal works now with the same energy as when he was 50. He feels he should work continuously to complete many of his important researches as soon as possible. The changes of weather affect his health, so during the last winter he lived in an artificial atmosphere while working, so as not to lose time. He spent his eightieth birthday, as every day of his life, over his microscope.

A Philanthropist Dies

The Marques de Valdecilla, a well known Spanish philanthropist of Santander, died. He gave a great part of his fortune (which was made in America) to universities and hospitals and in promoting medical education. He was the founder of the Hospital Valdecilla of Santander, which he supported. He gave 25,000,000 pesetas ($2,500,000) to medical schools and hospitals. Since rich persons in Spain are few, the fortune of Marques de Valdecilla was considered fabulous and everybody praises him for giving a large part of it to the benefit of mankind. He will always be remembered with respect and admiration.

Marriages

CHARLES J. WEIGEL, River Forest, Ill., to Miss Mary Beatrice Rooney of Amboy, June 4.

WILLIS E. ELDER to Miss Elsie Schneider, both of Columbus, Ohio, at Cannonsburg, Pa., May 7.

JAMES CLAYTON BROWN, Valparaiso, Ind., to Miss Mary Birdwell Davis of Elwood, May 8.

F. DENNETTE ADAMS, Boston, to Miss Elliott O. Blanc of New York, May 21.

LEON N. SUSSMAN to Miss Evelyn Kaufman, both of New York, June 8.

Deaths

Thomas Patrick Hennelly ✠ Pittsfield, Mass.; Harvard University Medical School, Boston, 1908; past president of the Berkshire District County Medical Society; fellow of the American College of Surgeons; on the staffs of the House of Mercy Hospital, St. Luke's Hospital and Crippled Children's School, Pittsfield, and the Fairview Hospital, Great Barrington; aged 50; died, May 19, of heart disease.

Thomas Appleton Cope, Philadelphia; University of Pennsylvania School of Medicine, Philadelphia, 1900; member of the Medical Society of the State of Pennsylvania; assistant professor of medicine at the University of Pennsylvania Graduate School of Medicine; pathologist to the Germantown Hospital; aged 53; died, May 27, of heart disease, while on a boat trip in Maryland.

Rewellien Cornelius Peters, Allentown, Pa.; Medico-Chirurgical College of Philadelphia, 1898; member of the Medical Society of the State of Pennsylvania; past president of the Lehigh County Medical Society; member of the school board; aged 62; died, May 19, of arteriosclerosis and cerebral hemorrhage.

William Ernest Fleet, Cambridge, Mass.; College of Physicians and Surgeons, Boston, 1893; Tufts College Medical School, Boston, 1895; member of the Massachusetts Medical Society; aged 59; died, May 25, of hypertension, arteriosclerosis, cerebral hemorrhage and hypostatic pneumonia.

Charles A. Zinn, Frankfort, Ind.; Central College of Physicians and Surgeons, Indianapolis, 1897; member of the Indiana State Medical Association; health officer of Frankfort; aged 58; on the staff of the Clinton County Hospital, where he died, May 22, of cerebral hemorrhage.

Heralda Palma Tyng, San Francisco; Hahnemann Medical College of the Pacific, San Francisco, 1917; member of the Associated Anesthetists of the United States and Canada; aged 40; died, May 1, in the Franklin Hospital, of acute hemorrhagic nephritis and puerperal eclampsia.

Edward Beecher Nims, Springfield, Mass.; University of Vermont College of Medicine, Burlington, 1864; member of the Massachusetts Medical Society; member of the American Psychiatric Association; Civil War veteran; aged 94; died, May 24, of chronic nephritis.

William Gue Morgan, Woodward, Iowa; Rush Medical College, Chicago, 1891; member of the Iowa State Medical Society; on the staff of the Hospital for Epileptics and School for Feebleminded; aged 64; died, May 17, of cerebral hemorrhage.

Alfred Long Gaither ✠ Lieut., U. S. Navy, San Diego, Calif.; University of Pennsylvania School of Medicine, Philadelphia, 1918; entered the Navy in 1921; on the staff of the U. S. Naval Hospital; aged 38; died, April 10.

Irwin T. Medsker, Indianapolis; Central College of Physicians and Surgeons, Indianapolis, 1904; member of the Indiana State Medical Association; aged 55; died, May 14, in St. Vincent's Hospital, of injuries received in a fall.

Norris A. Smith, Lineville, Iowa; Kansas City (Mo.) Medical College, 1905; aged 53; died, May 13, in the Wright Hospital, Trenton, Mo., of injuries received when the automobile in which he was driving was struck by a train.

Charles Sumner Morley, Holly, Mich.; Homeopathic Hospital College, Cleveland, 1876; for many years on the staff of the Grace Hospital, Detroit; aged 80; died, May 28, of intestinal obstruction and cardiac decompensation.

Humphrey D. Robinson, Manistee, Mich.; Detroit Medical College, 1884; member of the Michigan State Medical Society; on the staff of the Mercy Hospital and Sanitarium; aged 74; died, May 14, of heart disease.

George Hiram Robbins ✠ Madison, Wis.; Rush Medical College, Chicago, 1915; formerly assistant professor of clinical medicine, University of Wisconsin Medical School; aged 42; died, May 26, of cerebral hemorrhage.

Gamaliel C. Myers, Dayton, Ohio; Cincinnati College of Medicine and Surgery, 1880; Civil War veteran; for twelve years on the staff of the Miami Valley Hospital; aged 84; died, May 24, of cerebral hemorrhage.

Henry E. Johnston, Oshkosh, Wis.; Chicago Homeopathic Medical College, 1893; member of the State Medical Society of Wisconsin; aged 67; died, May 22, in Edwardsburg, Mich., of a wound inflicted with a knife.

Edward S. Gooch, Lawton, Okla.; Hospital College of Medicine, Louisville, Ky., 1896; member of the Oklahoma State Medical Association; on the staff of the Southwestern Hospital; aged 62; died, April 14.

Oscar Hasencamp ✠ Toledo, Ohio; University of Tennessee Medical Department, Nashville, 1887; aged 68; on the staff of St. Vincent's Hospital, where he died, May 20, of bronchopneumonia and cystitis.

Woodson T. Merchant, Louisville, Ky.; Howard University School of Medicine, Washington, D. C., 1888; on the staff of the Red Cross Hospital; aged 70; died, May 13, of secondary anemia and gastric carcinoma.

Charles Francis McCaffrey ✠ Somerville, Mass.; Harvard University Medical School, Boston, 1903; on the staff of the Somerville Hospital; aged 55; died, May 20, of coronary sclerosis and thrombosis.

Whedon Worley Mercer ✠ Chillicothe, Ill.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1908; aged 47; died, May 20, in the Proctor Hospital, Peoria.

Leo A. Wilkinson, Colfax, La.; University of Nashville (Tenn.) Medical Department, 1907; county coroner; aged 49; died, May 9, in the Baptist Hospital, Alexandria, of appendicitis and peritonitis.

Charles Augustus Henry, Jr., Fostoria, Ohio; Rush Medical College, Chicago, 1901; member of the Ohio State Medical Association; aged 55; died, April 6, in the Cleveland Clinic Hospital.

Walter C. Goss, Johnson City, Tenn.; Tennessee Medical College, Knoxville, 1902; medical superintendent of the Elizabeth Goss Memorial Hospital; aged 61; died, May 12, of nephritis.

Frank Collins Garvey ✠ Scranton, Pa.; Medico-Chirurgical College of Philadelphia, 1909; on the staffs of the Mercy Hospital and the Scranton State Hospital; aged 49; died, April 17.

Harry Holmcombe Nelden, Stanhope, N. J.; Bellevue Hospital Medical College, New York, 1891; bank president; formerly mayor of Stanhope; aged 61; died, May 22, of heart disease.

Robert Maffet Palmer, Johnstown, Pa.; Jefferson Medical College of Philadelphia, 1913; member of the Medical Society of the State of Pennsylvania; aged 43; died, May 11, of heart disease.

James Morgan O'Connell, Ponca, Neb.; Rush Medical College, Chicago, 1881; member of the Nebraska State Medical Association; aged 79; died, April 13.

Green V. Daniel, Paintsville, Ky.; Tennessee Medical College, Knoxville, 1901; aged 66; died, April 6, in the Stephenson Hospital and Clinic, Ashland.

Martin J. Palmer, Los Angeles; Eclectic Medical Institute, Cincinnati, 1888; aged 71; died, May 14, of carcinoma of the bladder and prostate and uremia.

Frank Fisk Casseday, Portland, Ore.; Hahnemann Medical College of Philadelphia, 1879; aged 76; died, April 22, of cirrhosis of the liver.

Jeremiah Noble Hankins, Milton, Fla.; Memphis (Tenn.) Hospital Medical College, 1901; aged 52; died, May 20, of chronic myocarditis.

John Wesley Gillespie, Albany, Ga.; University of Georgia Medical Department, Augusta, 1892; aged 69; died, May 20, of senile dementia.

Myron G. Rood, Stevens Point, Wis.; Medical College of Ohio, Cincinnati, 1882; aged 73; died, May 27, of acute dilatation of the heart.

William Arthur Singleton, Port Huron, Mich.; Detroit College of Medicine, 1912; aged 56; died, May 22, in a local hospital.

James E. Goldsby, Gleason, Tenn.; University of the South Medical Department, Sewanee, 1901; aged 72; died in May.

Anna Moon Randolph, Hampton, Va.; Woman's Medical College of Pennsylvania, Philadelphia, 1899; aged 67; died, April 8.

Millard F. Deeren, Macksburg, Ohio; Columbus Medical College, 1887; aged 72; died, May 26, of diabetes mellitus.

Corwin F. Howard, Deepwater, Mo.; American Medical College, St. Louis, 1883; aged 76; died, April 9.

John H. Imme, Ottawa, Ill.; Eclectic Medical Institute, Cincinnati, 1880; aged 76; died in April.

Bureau of Investigation

ADULTERATED OR MISBRANDED PHARMACEUTICALS

A List of Some of the Notices of Judgment Issued Between January and June, 1931, Inclusive, by the Food and Drug Administration, U. S. Department of Agriculture

[For many years, the Bureau of Investigation has published in this department, brief abstracts of Notices of Judgment issued by the Food and Drug Administration of the United States Department of Agriculture against "patent medicines." The number of proprietary preparations of this type that each year are found misbranded or adulterated is so large that these abstracts have to be published frequently.

The same officials that deal with cases of adulteration and misbranding in proprietary package medicines also, of course, act to protect the public against adulterated or misbranded official pharmaceuticals. As most official products are made by reputable pharmaceutical houses, the number of cases of adulteration or misbranding in this particular group is small compared with cases in the "patent medicine" group. For this reason, the Bureau of Investigation has made a practice of abstracting each year such Notices of Judgment as have been published by the government during the previous calendar year. We present, at this time, a list of the Notices of Judgment issued during the first half of 1931 dealing with pharmaceuticals. These are arranged alphabetically by products. First is given the name of the product, then follows the name of the manufacturer, shipper, or consigner; finally the number of the Notice of Judgment and its date of issue. It is to be borne in mind that the dates of publication of the Notices of Judgment are always several months later than the date of seizure of the product.]

Aconite Tincture.—Tilden Company, New Lebanon, N. Y. (*N. J. 17325; January, 1931.*)

Aletris Root.—Hamilton-Bacon-Hamilton Company, Bristol, Va. (*N. J. 17174; January, 1931.*)

Antipyrine Tablets.—George A. Breon and Company, Kansas City, Mo. (*N. J. 17848; June, 1931.*)

Aspirin.—J. R. Watkins Company, Winona, Minn. (*N. J. 17153; January, 1931.*) McCormick and Company, Baltimore, Md. (*N. J. 17642; April, 1931.*)

Bacillus Acidophilus Cultures.—H. K. Mulford Company, Philadelphia, Pa. (*N. J. 17161; January, 1931.*)

Bacillus Bulgaricus Culture A.—Ferment Company, New York City. (*N. J. 17158, 17219; January, 1931.*)

Barbital Tablets.—George A. Breon and Company, Kansas City, Mo. (*N. J. 17848; June, 1931.*)

Beef, Iron and Wine.—Devore Manufacturing Company, Columbus, Ohio. (*N. J. 17791; June, 1931.*)

Belladonna Extract.—Frederick Stearns and Company, Detroit, Mich. (*N. J. 17603; April, 1931.*)

Belladonna Fluid Extract.—Tilden Company, New Lebanon, N. Y. (*N. J. 17325; January, 1931*). American Laboratories, Inc., Richmond, Va. (*N. J. 17752; June, 1931.*)

Belladonna Tincture.—American Laboratories, Inc., Richmond, Va. (*N. J. 17752; June, 1931.*)

Benzoin Tincture.—Edward I. Lowell, New York City. (*N. J. 17771; June, 1931*).

Buchu, Compound Elixir.—Standard Drug Company, Spartanburg, S. C. (*N. J. 17169; January, 1931.*)

Calisaya Alkaloids Elixir.—Zemmer Company, Pittsburgh, Pa. (*N. J. 17463; March, 1931.*)

Calisaya Elixir.—Standard Drug Company, Newark, N. J. (*N. J. 17781; June, 1931.*)

Calomel Tablets.—George A. Breon and Company, Kansas City, Mo. (*N. J. 17848; June, 1931.*)

Camphorated Oil.—Tilden Company, New Lebanon, N. Y. (*N. J. 17325; January, 1931.*)

Camphor Spirits.—Southern Chemical Company, Petersburg, Va. (*N. J. 17302; January, 1931.*) Standard Drug Company, Newark, N. J. (*N. J. 17781; June, 1931.*)

Chloroform.—Samson Rosenblatt, New York City. (*N. J. 17627; April, 1931.*)

Cinchona Powdered Extract.—Frederick Stearns and Company, Detroit. (*N. J. 17603; April, 1931.*)

Cinchona Tincture.—Tilden Company, New Lebanon, N. Y. (*N. J. 17325; January, 1931.*) Frederick Stearns and Company, Detroit, Mich. (*N. J. 17603; April, 1931.*) American Laboratories, Inc., Richmond, Va. (*N. J. 17752; June, 1931.*) Standard Drug Company, Newark, N. J. (*N. J. 17781; June, 1931.*)

Cinchophen.—Zemmer Company, Pittsburgh, Pa. (*N. J. 17463; March, 1931.*)

Codeine Sulphate Tablets.—P. J. Noyes Company, Lancaster, N. H. (*N. J. 17841; June, 1931.*) C. M. Bundy Company, Indianapolis, Ind. (*N. J. 17911; June, 1931.*)

Colchicum Fluid Extract.—Frederick Stearns and Company, Detroit, Mich. (*N. J. 17603; April, 1931.*)

Cramp Bark.—E. A. Dobbin and Company, Lenoir, N. C. (*N. J. 17649; April, 1931.*)

Digitalis Tincture.—Tilden Company, New Lebanon, N. Y. (*N. J. 17325; January, 1931.*) Brewer and Company, Inc., Worcester, Mass. (*N. J. 17860; June, 1931.*)

Ergot Fluid Extract.—Burrough Bros. Manufacturing Company, Baltimore, Md. (*N. J. 17610; April, 1931.*) American Laboratories, Inc., Richmond, Va. (*N. J. 17752; June, 1931.*)

Ergot Solution.—Tilden Company, New Lebanon, N. Y. (*N. J. 17325; January, 1931.*)

Ether.—J. T. Baker Chemical Company, Phillipsburg, N. J. (*N. J. 17162, 17304, 17310; January, 1931; 17640; April 1931; 17917, 17966, June, 1931.*) Merck and Company, Inc., Philadelphia, Pa. (*N. J. 17155, January, 1931; 17609, 17619, April, 1931; 17854, 17909, 17939, 17965, 17967, June, 1931.*) Ohio Chemical and Manufacturing Company, Cleveland, Ohio. (*N. J. 17151, 17168, 17214, 17321, January, 1931; 17381, 17385, February, 1931; 17458, 17464, March, 1931; 17621, April, 1931.*) American Solvents and Chemical Corporation, Albany, N. Y. (*N. J. 17308, January, 1931; 17475, March, 1931; 17831, 17918, June, 1931.*) Mallinckrodt Chemical Works, St. Louis, Mo. (*N. J. 17466, March, 1931; 17796, 17919, 17941, June, 1931.*) Pacific Chemical Company, New York City and Edgewood, Md. (*N. J. 17845, 17953; June, 1931.*) Brewer Company, New York City. (*N. J. 17910; June, 1931.*) Martin Elias Company, Elizabeth, N. J. (*N. J. 17974; June, 1931.*)

Fowler's Solution Tablets.—C. M. Bundy Company, Indianapolis, Ind. (*N. J. 17911; June, 1931.*)

Ginger Fluid Extract.—Hub Products Company, Boston, Mass. (*N. J. 17452, March, 1931; 17773, June, 1931.*) American Products Company, Kansas City, Mo. (*N. J. 17606; April, 1931; 17758, June, 1931.*) Land Drug Company, Cincinnati, Ohio. (*N. J. 17605; April, 1931.*) Queen City Distributing Company, Cincinnati, Ohio (*N. J. 17604; April, 1931.*) De Lux Packing Company, Brooklyn, N. Y. (*N. J. 17751; June, 1931.*) Savoy Drug and Chemical Company, Chicago. (*N. J. 17769; June, 1931.*) York Distributing Company, Brooklyn, N. Y. (*N. J. 17765; June, 1931.*) Interstate Drug Company, Harlem Transfer, N. Y. (*N. J. 17922; June, 1931.*)

Magnesium Citrate Solution.—Citro-Nesia Company, Inc., Chicago. (*N. J. 17313; January, 1931.*)

Mercuric Iodide Tablets.—George A. Breon and Company, Kansas City, Mo. (*N. J. 17848; June, 1931.*)

Myrrh.—Devkapan-Adenwalla, Aden, Arabia. (*N. J. 17384; February, 1931*).

Niter, Sweet Spirits.—Standard Drug Company, Newark, N. J. (*N. J. 17781; June, 1931.*)

Nitroglycerin Tablets.—George A. Breon and Company, Kansas City, Mo. (*N. J. 17848; June, 1931.*)

Nux Vomica Tincture.—American Laboratories, Inc., Richmond, Va. (*N. J. 17752; June, 1931.*) Standard Drug Company, Newark, N. J. (*N. J. 17781; June, 1931.*) Brewer and Company, Inc., Worcester, Mass. (*N. J. 17860; June, 1931.*) P. J. Noyes Company, Lancaster, N. H. (*N. J. 17841; June, 1931.*)

Opium Tincture.—Frederick Stearns and Company, Detroit, Mich. (*N. J. 17603; April, 1931.*)

Phenolphthalein Tablets.—Tilden Company, New Lebanon, N. Y. (*N. J. 17325; January, 1931.*) Brewer and Company, Inc., Worcester, Mass. (*N. J. 17860; June, 1931.*)

Potassium Bromide Elixir.—Brewer and Company, Inc., Worcester, Mass. (*N. J. 17860; June, 1931.*)

Santonin and Calomel Tablets.—George A. Breon and Company, Kansas City, Mo. (*N. J. 17848; June, 1931.*) P. J. Noyes Company, Lancaster, N. H. (*N. J. 17841; June, 1931.*)

Sodium Salicylate Elixir.—Zemmer Company, Pittsburgh, Pa. (*N. J. 17463; March, 1931.*)

Sodium Salicylate Tablets.—Brewer and Company, Inc., Worcester, Mass. (*N. J. 17860; June, 1931.*)

Sodium Sulphocarbolate Tablets.—George A. Breon and Company, Kansas City, Mo. (*N. J. 17848; June, 1931.*)

Strychnine Nitrate Tablets.—Frederick Stearns and Company, Detroit, Mich. (*N. J. 17603; April, 1931.*)

Strychnine Sulphate Tablets.—Frederick Stearns and Company, Detroit, Mich. (*N. J. 17603; April, 1931.*) George A. Breon and Company, Kansas City, Mo. (*N. J. 17848; June, 1931.*) P. J. Noyes Company, Lancaster, N. H. (*N. J. 17841; June, 1931.*)

Trional Tablets.—George A. Breon and Company, Kansas City, Mo. (*N. J. 17848; June, 1931.*)

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

EFFECTS OF RADIUM AND RADON GAS TAKEN INTERNALLY

To the Editor:—The papers all over the United States have had articles reporting the death of Eben M. Byers from a "patent medicine" that he had been imbibing for the last two years, containing radium. Considering the cost of refined radium, it stands to reason that there was only an infinitesimal amount, if any, of the element present in the "patent medicine" under consideration; hence radium in the form of carnotite or uranium ore was used, containing many other ingredients besides radium that could have caused the ill effects reported. Have any tests been made on niton gas, or radon for internal use, and if so what would be the results of taking this gas suspended in water into the system for the amelioration or cure of various metabolic ailments? I have a number of patients taking radon emanations in water, 2,000 mache units in a liter of water daily, and the majority report excellent results; a few report no change, but none has reported, so far, any actual ill effects. Some of the patients have taken this remedy to the exclusion of all else for six months or more, most of them for lesser time. I am using an emanator, to produce radon gas, manufactured in this city (Los Angeles) by the Zimmer Laboratories, Bendix Building.

A. S. WAISS, M.D., Los Angeles.

ANSWER.—This question was referred for reply to Dr. Frederick B. Flinn, Columbia University, who made special studies of the case of Mr. Byers. Dr. Flinn writes:

"The death of Mr. Eben M. Byers was caused by the ingestion of radioactive material over a period of months. Electroscopic tests, the history and the clinical picture leave no doubt in the matter. The necropsy confirmed the diagnosis. The whole picture was the same as that presented by the cases of "radium poisoning" among dial painters. Pneumonia was one of the accidental terminal conditions. Phosphorus did not enter into the picture in any manner. Attempts of the physical therapist who recommended Radithor to Mr. Byers to cloud the issue by saying that the death "was the result of a combination of blood diseases which induced gout" shows a deplorable ignorance in the matter. Mr. Byers had an anemia, which is always present in radium cases in the advanced stage, but there was no evidence of gout during the year that I saw him. It might be interesting to say that out of the "dozen patients on radium water at any one time" of the foregoing physical therapist I have had two cases of radium poisoning—Mr. Byers and one other, in which death occurred in September, previous to the death of Mr. Byers. The second patient was brought to me the same time that Mr. Byers was and to the best of my information they took the medicine on recommendation from the same source. Both were radioactive.

"Radithor by my own tests contained 2 micrograms of radioactive material in solution. This test was made on five bottles which Mr. Byers gave me on his second visit and which he said was the preparation he had been taking. It contained both radium and mesothorium chlorides. Radium chloride can be bought for around 20 cents per microgram, mesothorium at a slightly lower price. Radium itself is quoted at $70 a milligram, which makes the metal itself worth 7 cents a microgram. Expense is a trivial matter.

"Water jars lined with carnotite or uranium ore constitute a potential danger because of the possibility of such metals as vanadium, uranium or arsenic dissolving out. I have had cases which suggested such a possibility called to my attention. These salts are poisonous. I am informed that illness occurred among the miners of radium ores in Portugal. At first it was thought it was caused by the radioactivity in the water which they drank, but it was found that the radioactivity had disappeared and that the trouble was due to salts of these metals which had gone into solution.

"On account of the slight solubility of radon or niton in water as compared with some gases, it is doubtful whether it remains in the system very long. My own experiments show that in half an hour 82.5 per cent is eliminated and 97.5 in an hour and a half. At the end of from four to five hours the expired breath is negative. Tests on persons who have drunk water for a year containing more than 2,000 mache units show at the most the mere trace of any radioactivity. These tests are not completed but will be in the near future, when the results will be reported.

"Radon is toxic to some extent. The emanations from a gram of radium bromide will kill mice in two days. Deaths have been reported when workers have been exposed to large amounts of emanation over a period of time. It will kill tissue, as tests in my own laboratory show. The advantage of radon is that the treatment can be stopped at any time by the physician and the exposure ceases. However, there is need of well controlled experiments to show definitely the value of its use. It should never be taken except under the advice of a physician who is qualified by his knowledge of physics to administer it."

In spite of many years of trial, acceptable evidence for the value of the internal use of radium solutions or of water containing radon has not become available, and until such evidence does become available the Council on Pharmacy and Chemistry has decided not to accept generators for the production of water charged with radon.

TREATMENT OF HEMORRHOIDS

To the Editor:—A patient has acute prolapsed internal hemorrhoids with strangulation by a reflexly contracted sphincter accompanied by prolapse of the mucous membrane of the anus. To obtain reduction I used alternately the application of cold and a solution of epinephrine hydrochloride and chlorbutanol. Thirty-six hours after, and though the reduction was easily made, the internal hemorrhoid with the mucous membrane of the anus prolapsed again. As I examined the patient I discovered there was an inflammation of the mucous membrane of the rectum and advised my patient to undergo an operation to avoid possible disastrous consequences. He complied with my advice and was operated on. Some friend or parent of the patient called on him at the hospital and said that he had the same trouble and was cured by application of hot compresses without operation. My patient, believing him, blames me, saying that if I applied hot compresses instead of cold and epinephrine, the operation could have been avoided. The surgeon who made the operation cut off four inches of the diseased portion, more than he believed when he first examined him. I should like to have your opinion in the matter, whether I was right in the application of cold and epinephrine with chlorbutanol and recommending an operation; or could the application of hot compresses make the operation unnecessary. I will appreciate a prompt answer. Please omit name. M.D., New York.

ANSWER.—The advising of cold applications and epinephrine and chlorbutanol locally, and eventually an operation, was for the best interests of the patient and therefore proper advice. It is true that occasionally thrombotic hemorrhoids will recede by expectant treatment, but by far the best treatment is to remove the clot, which offers the patient the safest and speediest convalescence.

HYALINE CASTS

To the Editor:—There seems to be a considerable lack of agreement on the part of the home office examiners of certain insurance companies, on the one hand, and of the general profession, on the other, concerning the significance of hyaline casts in the urine. Assuming that, in a given case, albumin is not present, there is good concentration, and other clinical and laboratory examinations give negative results, but that occasional or even frequent centrifugated specimens of urine show hyaline casts in no large numbers, a discussion in your careful way as to their prognostic significance might be of wide interest. Such a discussion or reference to similar discussions in previous issues of THE JOURNAL will be highly appreciated. CHARLES H. STODDARD, M.D., Milwaukee.

ANSWER.—Between better informed members of the profession and similar home office insurance men there is no disagreement concerning the significance of hyaline casts. Both will look for some reasonable explanation in any apparently healthy case with normal clinical and laboratory observations, including good concentration when casts are found frequently and in no large numbers, as the inquiry puts it.

If the patient is middle-aged or older, and especially if actively engaged, both will incline to follow Osler and look on the casts somewhat in the same way as gray hairs. If the patient is younger, they will look for strains or exposures to explain the meaning of the casts. Thus, one young man dolled himself into a rosy condition for insurance examinations, which had to be repeated because of the finding of casts, by working in a gymnasium and taking a cold plunge before furnishing specimens of urine. Another always found it more convenient to furnish specimens on his return to work just after bicycling four miles to eat a hurried dinner and do chores about the house. Still another went light on lunch so as to have an appetite for dinner, and all of the specimens he passed just before eating were acid and contained acetone as well as casts. A wide variety of similar instances, including prohibition liquor, might be cited to illustrate the advisability of seeking a reasonable explanation for the casts in such cases as those referred to.

Such cases offer an ideal field for applying the principles of preclinical medicine or the promotion of longevity because it is well known that frequent strains or malfunctions extending over long periods tend to lead to organic changes. Thus, the assumption that habits which are perfectly harmless for some may be harmful to others is borne out by insurance experience, which indicates that casts in protein-free urine are apparently

without effect on mortality statistics until after a lapse of ten years or more.

Taking all ages together, it is interesting to note that insurance experience fails to show any difference in significance as between hyaline and granular casts, although fewer granular casts are expected in younger persons; also that the exhibition of casts, intermittently or constantly, does not give an unfavorable insurance experience when the cases are known to be uncomplicated. When there are complications, the picture naturally changes immediately to another, which depends on the nature of the complication.

Quantitative microscopy, which takes no more time or trouble than far less informatory methods, and sufficiently sensitive urine tests also tend to diminish disagreements because they help to clarify cases with doubtful urinary manifestations. When practitioners are in possession of information which home office insurance men do not have, or vice versa, disagreements are, of course, likely to occur, which are more apparent than real.

TUBERCULOSIS OF KIDNEY

To the Editor:—1. What is the prognosis following the positive diagnosis of tuberculous kidney? 2. The frequency of spontaneous recovery? 3. What characterizes the terminal stage? 4. A positive bacteriologic diagnosis of right tuberculous kidney was made over six years ago. At present, roentgen examination shows extensive calcification of the pelvis and ureter. The phenolsulphonphthalein test shows function about one-fourth normal. Cystoscopy shows ulceration of the right ureteral orifice and the trigon of the bladder. Bacteriologic examination of the urine from the right kidney and bladder is positive for tuberculosis. The only positive observation on the left kidney is irritation of the ureteral orifice. What is the probability of involvement of the left kidney? Please discuss the advisability of surgical removal of the right kidney and the prognosis with or without surgery. M.D., Calif.

ANSWER.—1. The prognosis in cases of renal tuberculosis is good in cases that are treated by nephrectomy. However, bladder symptoms may persist after the kidney has been removed, and the duration of the bladder symptoms after the nephrectomy is dependent on the duration of the disease before the nephrectomy was done. In the largest number of cases, especially the early ones, the bladder symptoms completely disappear.

2. Spontaneous recovery rarely, if ever, occurs. It is doubtful whether there are any proved cases of healed renal tuberculosis.

3. The terminal stage is often marked by frequent and painful urination, hematuria, great urgency, and incontinence. The causes of death are tuberculosis of the lung, tuberculosis in the opposite kidney, tuberculous meningitis, miliary tuberculosis, and occasionally nephritis in the remaining kidney.

4. The only way to answer the question relative to the possibility of involvement of the left, or opposite, kidney is by means of ureteral catheterization, with careful bacteriologic study of the urine for tubercle bacilli. This may be done by direct smear or by guinea-pig inoculation. Intravenous pelography may be done as an adjunct, and finally, if indicated, a retrograde pyelogram. In this case nephrectomy may be done. The prognosis with surgery is good; without surgery, bad.

ELECTROPHORESIS AS MEASURE OF VIRULENCE

To the Editor:—I should like to know something about the value of the Falk electrophoretic method of measuring the virulence of diphtheria bacilli. Is this just an experiment or has it really proved to be of value?

E. M. LUCKE, M.D., Hannibal, Mo.

ANSWER.—The published evidence is conflicting. Stone and Weigel (*Am. J. Pub. Health* **19**:1133 [Oct.] 1929), who tested eighty-seven pure cultures of the diphtheria bacillus by the electrophoretic method of Falk and his co-workers and by animal inoculations, believed that their results demonstrated "the impracticability of applying the test to routine public health control practice." On the other hand, R. L. Thompson (*Am. J. Hyg.* **14**:235 [Sept.] 1931) found in a study of 173 cultures "belonging to the diphtheria group of organisms" that toxigenic and nontoxigenic cultures could generally be separated by the method of electrophoresis, the toxigenic organism migrating more slowly than the nontoxigenic. Thompson also found, however, that, contrary to the results of Jacobson and Falk, no relation existed between the virulence of a pneumococcus strain for white mice and the electrophoretic rate of migration for that strain. Obviously a method that gives diverse results in the hands of different experimenters should be adopted cautiously, if at all, as a decisive routine diagnostic test in a public health laboratory.

IRRITANTS AND GASES AFFECTING WORKERS IN SILO

To the Editor:—From four to eight hours after working in a silo, a farm laborer has been troubled by coughing, headache, aching joints and subjective sensations of fever. These are not the usual symptoms of either carbon dioxide or carbon monoxide poisoning. I should be glad to know what gases are generated in a silo and whether there are cases of a fatal result. The symptoms referred to last with lessening severity for a day or two. W. J. LEROSSIGNOL, M.D., Denver.

ANSWER.—The prime harmful gas associated with the storage of ensilage is carbon dioxide. This gas may exist in quantities up to 75 per cent of the atmosphere, the remainder being made up almost entirely of nitrogen. Such a combination will not support life. Isolated instances of fatalities occur from time to time, but the most complete presentation of the problem may be found in an article by Mayhurst and Scott (The JOURNAL, Oct. 31, 1914, p. 1570) reporting four fatal cases.

Carbon dioxide is not an intoxicant. As best known, it acts solely through its displacement of oxygen. In silos its abnormally high percentage is limited to the immediate time of filling with ensilage and it rapidly diminishes thereafter, so that at the end of two or three weeks no large quantity is present.

While carbon dioxide is not an irritant gas, there is associated with it an irritant, which is described by Hayhurst and Scott as "startling, pungent, alcohol-smelling, which irritates the mucous membranes and throat considerably." It is probable that this irritant is a combination of such volatile ingredients as butyric, propionic, acetic and lactic acid. The fluid that settles to the bottom of the silo contains, after fermentation, between 2 and 3 per cent of alcohol. Intoxication has been attributed to the drinking of this fluid as a beverage.

Of the case cited in the query it is believed that the manifestations may fully be accounted for on one or more of these assumptions:

(*a*) The condition may be low grade respiratory irritation from volatile acids.

(*b*) It may be allergic, following sensitization due to exposure to protein-containing dusts.

(*c*) Mechanical irritation by ensilage dusts may have inaugurated bacterial action along the respiratory tract.

Many forms of ensilage are well known, ranging from alfalfa to sunflower. It is probable that particular forms of ensilage may contain peculiar irritants, such as arise from oxidized sunflower seed oil.

PITUITARY DEFICIENCIES

To the Editor:—Will you kindly outline the management of the various pituitary disorders from an endocrine standpoint, particularly in regard to glandular and radiation therapy? Recently a man, aged 31, came to me complaining of weakness, insomnia, recent increase of weight from 180 to 200 pounds (81.6 to 90.7 Kg.), and loss of mental acuity and capacity for sustained effort in the profession of law. The libido is decreased, and sexual congress increases mental apathy and leaves the patient depressed and irritable. Physical exertion quickly brings on fatigue and predisposes to infections of the upper respiratory tract. The latter are common. There are no marital, business or social conflicts. There have been two children, aged 4 and 1, both girls, who are living. The cardinal points in the physical examination are as follows: height, 5 feet 11 inches (180 cm.); weight, 200 pounds (90.7 Kg.); dilated left pupil; otherwise, reflexes normal, with vision 18/20 in the right eye and 14/20 in the left, corrected to 20/20 with glasses; thick, coarse, graying brown hair, with large, coarse eyebrows; left ethmoiditis; prominent nasal bones and hat size 7½. The thyroid is slightly enlarged and soft; the collar size is 16. There is a definite increase in collar fat pads and pelvic girdle fat. The breasts are quite large. The pulse ranges from 60 to 64; the blood pressure is 132 systolic and 80 diastolic. The abdomen is slightly obese. The testicles are about 50 per cent reduced in size and somewhat increased in firmness. The hands are large and well formed, size 8½; the feet are equally large, a size 11 B shoe being necessary. Two basal metabolic tests were done giving —18 on each occasion. The Kahn reaction is negative. A test of the spinal fluid was not done. The sella turcica is larger than normal. The patient has had a persistent tinea infection of the feet, the right hand and the scalp for the past four years. Recently an initial attack of pityriasis rosea appeared and is now receding. Headaches are rare and appear only during exacerbations of the respiratory infections. Soreness of both eyes is a marked symptom. Anything you can suggest will be greatly appreciated. Please omit name. M.D., Philadelphia.

ANSWER.—It is not possible, in this space, to outline fully the management of the various pituitary disorders. It may be said briefly that for the so-called hypopituitary states either low dosage roentgen therapy, applied to bitemporal fields 5 x 5 cm., or pituitary preparations subcutaneously, may be used. Pituitary tumors, of course, are treated either by surgical removal or by destructive dose of the x-rays.

Judging from the complaints of the patient, and from his size and build, the mammary development, testicular atrophy,

loss of libido, lack of physical and mental endurance, the gain in weight and the prominent eyebrows, it seems that he probably has had a hyperpituitarism, particularly of the anterior lobe, which has now regressed to the hypo state, which involves both lobes. In the way of clinching this diagnosis, one should know the results of a differential blood count, a determination of the visual fields, and the blood nonprotein nitrogen, uric acid and dextrose tolerance. The presence of eosinophilia, an increased sugar tolerance and high uric acid, together with contraction of the form and color fields, would speak for a hypopituitarism. The low basal metabolic rate suggests an involvement also of the thyroid.

In treatment, solution of pituitary and of anterior pituitary should be given subcutaneously to the point of tolerance and the dose should be repeated three times a week, wholly experimentally. The anterior pituitary preparation should be kept below the amount which produces a headache and the pituitary solution should be given in doses just short of those sufficient to produce intestinal cramps.

IMMUNITY AFTER TOXIN-ANTITOXIN IMMUNIZATION

To the Editor:—How long does one have immunity following the regular triple injection of toxin-antitoxin for diphtheria? Some texts seem to imply about six years and others do not state definitely.

E. C. HERBER, M.A., Carlisle, Pa.

ANSWER.—The experience of Park and Schroder (*Am. J. Pub. Health* **18**:1455 [Dec.] 1928) is in line with that of most observers. Twenty-five infants and young children who were positive to the Schick test in 1919, and who received two injections of toxin-antitoxin when retested in 1926, gave negative reactions in twenty-three tests, a positive reaction in one and a doubtful reaction in one. Either 92 or 96 per cent retained their immunity. They also made observations on seventy-eight adults, originally giving a positive Schick test, who became negative in 1920 after one or two series of injections of toxin-antitoxin. Retested in 1928, at least 75 per cent had retained their immunity. They conclude that lapses are not great enough to make it necessary to reinject or retest as a public health measure, and that children seem to hold their immunity somewhat better than adults. They give the wise warning, however, that in time of exposure there is never certainty that a person's immunity has persisted. It must be remembered that immunity does not always result from the triple injection of toxin-antitoxin, and that this can be determined only by a subsequent Schick test.

SUBUNGUAL EXOSTOSIS

To the Editor:—A man, aged 60, a shoe cobbler, noticed about four months ago a horny growth forming under his left thumb nail. It is as hard as bone, cavernous, and slightly darker than the nail. The growth has gradually increased in thickness until now it is about one-fourth inch in thickness. Three months ago a similar condition appeared under the right thumb nail and now his left great toe nail is becoming involved. The growth pushes the nail upward to such an extent that the pressure from his shoe causes pain. What is this condition? Please state cause and suggest treatment. Please omit name. M.D., Missouri.

ANSWER.—This condition may be that rare type of subungual lesion discussed by L. W. Shaffer (Subungual Exostoses, *Arch. Dermat. & Syph.* **24**:371 [Sept.] 1931), who believes that these abnormalities arise from cartilaginous rests. "As the cartilaginous bud develops, it grows upward, seemingly as a branch from the phalanx; this bud, when it becomes completely osseous in a typical mature specimen, consists externally of dense cortex and internally of trabecular structure, both of which are directly continuous with the corresponding structures of the phalanx." Contrary to this concept is the fact that the lesions described by Shaffer are almost invariably limited to the great toes. Also these lesions commonly occur early in life and before 50. Trauma is mentioned as an important factor which may in this case be significant, since in a cobbler much pressure trauma arises from the hand sewing of shoes and in other shoe repairing operations. These tumors are benign and are to be accepted as teratologic anomalies rather than neoplastic. Simple paring is not efficacious; recurrences are likely to follow. Total excision is the best method of treatment, without, however, injury of the matrix. Details of the operative procedure are furnished in the article cited. Roentgen examination, except in very early cases, will establish the condition as an exostosis if such is the case. If not, consideration must be given to the possibility of granuloma pyogenicum, warts, simple fibroma, and a malignant condition.

Council on Medical Education and Hospitals

COMING EXAMINATIONS

ALABAMA: Montgomery, July 11. Sec., Dr. J. N. Baker, 519 Dexter Ave., Montgomery.

AMERICAN BOARD FOR OPHTHALMIC EXAMINATIONS: Montreal, Sept. 19. Sec., Dr. William H. Wilder, 122 S. Michigan Ave., Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY: Montreal, Sept. 17. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

ARIZONA: Phoenix, July 5-6. Sec., Dr. B. M. Berger, 12 North Central Ave., Phoenix.

CALIFORNIA: San Francisco, July 11-14. Sec., Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.

COLORADO: Denver, July 5. Sec., Dr. Wm. Whitridge Williams, 422 State Office Bldg., Denver.

CONNECTICUT: *Regular.* Hartford, July 12-13. *Endorsement.* July 26. Sec., Dr. Thomas P. Murdock, 147 W. Main St., Meriden. *Homeopathic.* New Haven, July 12. Sec., Dr. Edwin C. M. Hall, 82 Grand Ave., New Haven.

DISTRICT OF COLUMBIA: Washington, July 11-12. Sec., Dr. W. C. Fowler, 203 District Bldg., Washington.

HAWAII: Honolulu, July 11-14. Sec., Dr. James A. Morgan, Room 48 Young Bldg., Honolulu.

MAINE: Augusta, July 5-6. Sec., Dr. Adam P. Leighton, Jr., 192 State St., Portland.

MASSACHUSETTS: Boston, July 12-14. Sec., Dr. Stephen Rushmore, 144 State House, Boston.

NORTH DAKOTA: Grand Forks, July 5-8. Sec., Dr. G. M. Williamson, Grand Forks.

OREGON: Portland, July 5-7. Sec., Dr. C. J. McCusker, 1014 Medical Dental Bldg., Portland.

PENNSYLVANIA: Philadelphia and Pittsburgh, July 5-9. Sec., Mr. Charles D. Koch, Dept. of Public Instruction, Harrisburg.

RHODE ISLAND: Providence, July 7-8. Dir., Dr. Lester A. Round, 319 State Office Bldg., Providence.

SOUTH DAKOTA: Waubay, July 19. Dir., Dr. H. R. Kenaston, Bonesteel.

UTAH: Salt Lake City, July 6-8. Dir., Mr. S. W. Golding, 326 State Capitol Bldg., Salt Lake City.

WASHINGTON: *Basic Science.* Seattle, July 7-8. *Regular.* Seattle, July 11-12. Dir., Mr. Charles Maybury, Olympia.

WEST VIRGINIA: Harpers Ferry, July 12. Sec., Dr. W. T. Henshaw, State Health Dept., Charleston.

Colorado April Report

Dr. William Whitridge Williams, secretary, Colorado Board of Medical Examiners, reports the written examination held at Denver, April 6-9, 1932. The examination covered 8 subjects and included 80 questions. An average of 75 per cent was required to pass. Three candidates were examined, all of whom passed. Four physicians were licensed by endorsement. The following colleges were represented:

PASSED	Year Grad.	Per Cent
University of Colorado School of Medicine	(1931)	86.7
Rush Medical College	(1932)	90.3
Osteopath		75

LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
College of Medical Evangelists	(1931)	California
Rush Medical College	(1929)	Illinois
Indiana University School of Medicine	(1925)	Indiana
Washington University School of Medicine	(1925)	Missouri

California Reciprocity Report

Dr. Charles B. Pinkham, secretary, California Board of Medical Examiners, reports 58 physicians licensed by reciprocity with other states and 5 physicians licensed by endorsement from Jan. 2 to April 14, 1932. The following colleges were represented:

LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Arkansas School of Medicine	(1930)	Arkansas
University of Colorado School of Medicine	(1917), (1930), (1922)	Colorado, Virginia
Emory University School of Medicine	(1926)	Georgia
Southern Medical College, Georgia	(1893)	Colorado
Chicago Medical College	(1888), (1894)	Illinois
Coll. of Phys. and Surgs. of Chicago	(1892), (1894), (1911)	Illinois
Hahnemann Medical College and Hospital, Chicago	(1920)	Illinois
Northwestern University Medical School	(1923)	Utah
Rush Medical College	(1895), (1919) Iowa, (1910), (1901), (1911, 2), (1929, 2)	Utah, Illinois
University of Illinois College of Medicine	(1916)	Illinois
Indiana University School of Medicine	(1911)	Indiana
State University of Iowa College of Med	(1897), (1927)	Iowa
University of Kansas School of Medicine	(1922)	Montana
Tulane University of Louisiana School of Medicine	(1924)	Louisiana
Baltimore Medical College	(1890)	Maryland
Harvard University Medical School	(1921)	Utah
University of Minnesota Medical School	(1922), (1925)	Minnesota
Ensworth Medical College, Missouri	(1913)	Missouri

Washington University School of Medicine.....(1923) (1924) Missouri	Montana,
University of Nebraska College of Medicine.....(1920) (1928) Idaho	Nebraska,
Columbia University College of Phys. and Surgs.....(1926)	Virginia
Cleveland Medical College, Homeopathic.....(1895)	Florida
Miami Medical College, Cincinnati.....(1903)	Ohio
Ohio Medical University.....(1902)	N. Dakota
Starling-Ohio Medical College.....(1913)	Ohio
University of Cincinnati College of Medicine.....(1925)	Ohio
University of Oregon Medical School.....(1905)	Oregon
Jefferson Medical College of Philadelphia.....(1913)	Connecticut, Maine
Woman's Medical College of Pennsylvania.....(1907)	Penna.
University of Pennsylvania Department of Medicine..(1898)	New York
University of Pennsylvania School of Medicine.....(1925)	Montana
Medical College of the State of South Carolina.....(1925)	Minnesota
Chattanooga Medical College, Tennessee.....(1910)	Texas
Vanderbilt University School of Medicine.....(1926)	Tennessee
Marquette University School of Medicine.....(1928)	Minnesota
University of Manitoba Faculty of Medicine.....(1924, 2) (1925) Arizona	N. Dakota,
McGill University Faculty of Med..(1903)	New York, (1909) Washington
Moscow State University Faculty of Medicine.....(1889)	Illinois

LICENSED BY ENDORSEMENT

College	Year Grad.	Endorsement of
Yale University School of Medicine.....(1927)		N. B. M. Ex.
Harvard University Medical School.....(1928)		N. B. M. Ex.
University of Oregon Medical School.....(1923)		N. B. M. Ex.
University of Pennsylvania School of Med..(1919), (1926)		N. B. M. Ex.

Montana April Report

Dr. S. A. Cooney, secretary, Montana State Board of Medical Examiners, reports 6 physicians licensed by reciprocity with other states, April 15, 1932. The following colleges were represented:

LICENSED BY RECIPROCITY

College	Year Grad.	Reciprocity with
Northwestern University Medical School.....(1930)		California
University of Minnesota Medical School.....(1930, 2)		Minnesota
University of Nebraska College of Medicine.....(1925, 2)		Nebraska
University of Oregon Medical School.....(1930)		Washington

Book Notices

The Human Voice: Its Care and Development. By Leon Felderman, M.D. Cloth. Price, $2.50. Pp. 301, with 22 illustrations. New York: Henry Holt & Company, 1931.

Either directly or indirectly, many organic and psychologic factors, including disease, are capable of influencing the complicated and difficult function of artistic voice production, particularly singing. The author conceives that all these factors should be comprehended and information concerning them placed at the disposal of the vocalist and vocal trainer. The theme is both important and ambitious. In each of most of the forty-eight chapters, some disease or other organic or psychologic factor supposedly bearing on artistic voice production is discussed. For the most part the subjects treated refer to the air passages directly, for example, "laryngitis" and "nervous disorders of the pharynx"; but other chapters discuss more indirect subjects, such as "headache," "alcohol," "immunity from disease," and "goiter." Obviously the basis on which such discussions should rest is a clear analysis of the speech mechanism itself and the psychologic and physiologic principles involved in its employment for the purposes of singing; but the author's descriptions on these subjects (including also the illustrations) are largely vague and inadequate. Owing in part to the failure to build such foundations strongly, the relation of disease or other factors discussed to the function of singing is usually not clearly depicted. The chapters vary greatly in value. Generally speaking, the text lacks in clear analysis of its subjects, being somewhat sketchily presented. One comes to question the author's opinions. For example, without discussing especial individual susceptibility to the inhaled drugs of tobacco, or the significance of "inhaling" the smoke, or the possible irritative effects of tobacco on the mucous membranes, the author expresses the opinion, possibly fraught with danger, that tobacco is essentially harmless to the singer. The chapter on the anomalies of speech is especially confused and inadequate. Analysis of tonsillectomy from the point of view of the singer, a subject that especially needs clarification, is omitted. While the vocalist will find much of interest and value in this volume, its real significance lies in the initiation of a unique and valuable subject for book making. It is to be hoped that a future edition will appear with important revisions of the present text.

La maladie de Boeck: Sarcoïdes cutanées bénignes multiples. Par le Docteur A. Kissmeyer, médecin de l'Institut Finsen. Préface du Dr. J. Darier. Paper. Pp. 147, with 67 illustrations. Copenhagen: Levin & Munksgaard, 1932.

This is a monograph of real value, covering a phase of cutaneous medicine which has caused a great deal of discussion among dermatologists. In the preface, Darier highly congratulates the author on his work but shrewdly urges further research before entirely discarding the theory of a tuberculous causation. The introduction presents the historical background of the controversy over sarcoids. Following this is a clinical and histologic description of the various types of cutaneous sarcoid and of the involvement of the eye, mucous membranes, lymph nodes, lungs, muscles, internal organs and the bones. Special emphasis is placed on lung involvement. The chapter on etiology and pathogenesis discusses the theory of a tuberculous etiology of sarcoids from every possible angle, with the conclusion that the disease is not caused by the bacillus of Koch. The author compares the histologic appearance of sarcoid with that of leprosy, especially as it occurs in the osseous system. Prognosis and treatment are then discussed. The conclusion of the author is that this condition belongs among infective granulomas of unknown etiology; but histiogenetically he places it between tuberculosis and leprosy. The true worth of the illustrations has been lost because of the poor quality of paper used.

Nudism Comes to America. By Frances and Mason Merrill. Cloth. Price, $3. Pp. 300, with illustrations. New York: Alfred A. Knopf, 1932.

It remains for the psychologist to explain the nudist movement. From the standpoint of health there is no reason to believe that exposure of the entire body to sunlight and fresh air will accomplish any more than exposure of those portions of the body that do not shock the puritanical. The authors of this book have visited the nudists in their special assemblages abroad and in this country. They present a complete survey of the extent to which organized nudism has made its appearance among us. One chapter is entitled "What Physicians Think." In this chapter the authors have collected replies to a questionnaire, statements from the literature, quotations from magazines and newspapers and other material from all sorts of sources. They do not, of course, distinguish between competent scientific opinion and notions. The illustrations chosen for the book are photographs of nudism in action, but neither the female nor the male reproductions of nudism in the book are in general nearly as repulsive as most of the actual nudists when seen in their colonies. These pictures seem to have been chosen for the beauty of the models rather than for demonstration of conditions as they are.

Ernährung und Diät bei Tuberkulose. Von Dr. Med. Paul Rehfeldt, Polizei-Medizinalrat in Köln a. Rh. Unter Mitwirkung von Professor Dr. med. Adolf Bacmeister, leitender Arzt des Sanatoriums für Lungenkranke in St. Blasien. Paper. Price, 13.50 marks. Pp. 187. Dresden: Theodor Steinkopff, 1932.

In an introduction to this complete work, Bacmeister writes that the surgical treatment of pulmonary tuberculosis in recent years has made such strides that it has overshadowed dietetic considerations, and tuberculosis as a general disease has been neglected. The ideas of Sauerbruch, Herrmannsdorfer and Gerson restored interest in dietetic treatment. Their treatment has been successful in skin and bone tuberculosis but disappointing in the treatment of pulmonary tuberculosis. The book is divided into nine interesting chapters, beginning with metabolism in tuberculous patients. The Harris-Benedict tables are given in regard to caloric needs, and the variations from the normal in tuberculous patients are discussed in regard to the various foodstuffs. The concept of a demineralized body in tuberculosis is not accepted, but, in contrast with the healthy, the tissues have not the same capacity to fix the mineral salts. The relationships of the different minerals and the different vitamins to general immunity are fully discussed. The absence of a single vitamin in the diet favors the progress of tuberculosis. Scientific investigation has reestablished the value of cod liver oil. The relationship of constitution to tuberculosis is sketched from Hippocrates and Hufeland to the present time. Inherited constitution is influenced by climate, nourishment, training, work and illness. Tables are given to illustrate the

proper growth of children and the correct weights of adolescents. The three main types of Kretschmer, in regard to body form, are analyzed, the asthenic or narrow chested, the thick chested, and the athletic types. In puberty the proportion of tuberculous patients is highest in the asthenic type, and in this type there is less ability to develop immune bodies and to form connective tissue. The thick-chested type of individual has greater reaction power of the tissues to infection but is more prone to gout, arteriosclerosis and other constitutional diseases. This type has a better chance of overcoming tuberculosis. These constitutional types are discussed in relation to treatment such as climate, occupational therapy, and diet. Extensive dietetic tables are given with the balanced proportions of albumin, fat, carbohydrate and their resultant calories, and also depicting the mineral content of different foods. A body weakened by lack of food has an increased sensitiveness and a lessened resistance to tuberculosis. The central nations, impoverished in food during the World War, showed an astonishing increase in tuberculosis mortality. "Hunger is the reminder, appetite is the desire for food," and the art of diet and medication is described for the tuberculous in whom toxic conditions destroy appetite. The salt-free diet of Herrmannsdorfer is fully discussed and its advantages pointed out in skin, bone and joint tuberculosis, and in tuberculous fistulas. In pulmonary tuberculosis the addition to the diet of vitamin-containing vegetables and fruits, of cod liver oil and of calcium is stressed. Excellent results were seen in patients who could take daily six oranges, two raw egg yolks, a teaspoonful of cod liver oil after each meal, and a calcium preparation half an hour before each meal. The employment of insulin in diabetic patients is outlined, and tables of diet for these patients are given. The advantage of insulin for stimulating the gain in weight and well being of the nondiabetic tuberculous patient is pointed out. The dietetic treatment of intestinal and renal tuberculosis is fully discussed and also the dietetic treatment of nephritic complications. The book is thoroughly modern in the physiology of nutrition and represents a valuable contribution to the library of those engaged in tuberculosis work.

Man and Microbes. By Stanhope Bayne-Jones, M.D., Professor of Bacteriology, School of Medicine and Dentistry, University of Rochester, Rochester, New York. Cloth. Price, $1. Pp. 128, with 16 illustrations. Baltimore: Williams & Wilkins Company, 1932.

This little volume is a part of a series to be issued in connection with the Century of Progress Exposition in Chicago. The books are planned to make understandable the advance of science. It is doubtful whether any better performance could have been made as a contribution to this series than this book by the professor of bacteriology at the University of Rochester. He makes clear the place of discoveries in technic as the basis of advance in the science of bacteriology; he has a feeling for historical background, and he provides a vast number of facts of importance for the prevention of disease. The book is beautifully illustrated, well written and an exceedingly worthy contribution to the series.

Ergebnisse der Enzymforschung. Herausgegeben von F. F. Nord und R. Weidenhagen. Band I. Cloth. Price, 29 marks. Pp. 377, with 63 illustrations. Leipzig: Akademische Verlagsgesellschaft m.b.H., 1932.

The realm of enzyme research involves problems concerned alike with chemistry and with physiology and serves to establish a closer relationship between these two branches of science. For this reason the literature of enzyme studies is found widely scattered in natural science and medical publications. In order to offer a survey of material which is not easily accessible, the plan was developed to publish from time to time a collection of summarizing reports on various topics of enzyme research. The papers are designed not to be comprehensive reviews of the literature but rather to deal with special problems and particularly to present the writers' own work in the field. This volume is therefore the first of a series, which will appear at intervals in the future. The book includes an elaborate author index. References to the literature are given for all work discussed or mentioned. The summaries vary in length from six to forty pages, the average being approximately twenty pages. The material is presented in the language native to the author of the discussion; and the book therefore contains reviews written in English, French and German. The men chosen to present various phases of enzyme research are leaders in their respective fields and have aided in preparing an excellent book, which should be of value to those interested in the chemistry and the physiology of enzymes. The table of contents includes articles covering the thermodynamics of cell reactions, significance of oxidation-reduction potentials in enzymatic reactions, mechanism of enzyme action, physical chemical processes in enzyme reactions, alcoholic fermentation, proteolytic enzymes of the plant and animal world, specificity and mode of action of carbohydrates, bacterial enzyme reactions, acetic fermentation, tyrosinase, bone phosphatase, crystalline urease, crystalline pepsin, the oxygen transporting ferment of respiration, biochemistry of the lower fungi, and the activation of plant enzymes.

Hépatites et cirrhoses: Classification, pathogénèse et morphogénèse des hépatites diffuses aiguës, subaiguës et chroniques d'après les notions récentes sur la physiopathologie hépato-biliaire. Par Guy Albot. Préface du Pr. G. Roussy. Paper. Price, 34 francs. Pp. 247, with 56 illustrations. Paris: Masson & Cie, 1931.

The first part of this book on some of the common diseases of the liver deals with experimental data showing the evolution of acute diffuse hepatitis to more chronic forms. The second part is devoted to a scholarly discussion of anatomicoclinical material in which the experimental observations seem to be duplicated and the transition of hepatitis is traced to chronic forms and eventually to cirrhosis. It is emphasized that cirrhosis is a form of chronic inflammation of the liver, slow in development but involving all the elements of the liver lobule. The author describes in great detail the various pathologic and histologic changes, many of which are well illustrated by photomicrographs and by drawings. Much of the material represents personal experimental and anatomic study. The author's own observations are woven with the work of others into an interesting and compact discussion of the various forms of hepatitis and cirrhosis. Briefly, diffuse hepatitis is divided into three large groups: toxiinfectious, the hepatitis of biliary stasis, and the form associated with passive congestion. Transitional stages are described, linking the acute with the chronic forms and the latter with cirrhosis. It is stated that not all cases progress to the stage of cirrhosis but that some may stop at earlier periods in development. There then follows a copious list of protocols taken from anatomic and experimental studies. A good bibliography and a summary of the author's conclusions are found at the end.

The Aetiology of Tuberculosis. By Dr. Robert Koch. A translation from the German of the original paper announcing the discovery of the tubercle bacillus, read before the Physiological Society in Berlin, March 24, 1882, and published in the Berliner Klinische Wochenschrift, 1882, XIX, 221, specially prepared for The American Review of Tuberculosis, March, 1932, by Dr. and Mrs. Max Pinner. With an introduction by Dr. Allen K. Krause. Cloth. Price, 50 cents. Pp. 48, with 8 illustrations. New York: National Tuberculosis Association, 1932.

As a memento of the fiftieth anniversary of Koch's discovery of the cause of tuberculosis, the National Tuberculosis Association has published an English translation of the original essay of Koch together with an introduction by Dr. Allen K. Krause. The book is illustrated with facsimiles of the original illustrations in the book on the subject and the contribution to the *Klinische Wochenschrift*. The price of the publication is so reasonable that it should be in the library of every worker in the field.

Traitement de la tuberculose par la sanocrysine. Par Knud Secher, médecin-chef à l'Hôpital de Bispebjerg, Copenhague. Paper. Pp. 110, with 21 illustrations. Copenhagen: Levin & Munksgaard; Paris: J. B. Baillière & Fils, 1932.

This small monograph represents an exposition of the author's experience and ideas concerning treatment of tuberculosis with "Sanocrysin" (gold sodium thiosulphate). The frankness with which he admits the severe reactions and results at the beginning of the experiments is to be admired, for such is the lot of the pioneer; but the rather dogmatic assertions that the "reactions" are tuberculin reactions and the insistence on the necessity of heavy "sterilizing" doses are not to be accepted without question. The author's review of the literature in support of the tuberculin-like action is biased in favor of the theory, leaving out any reference to the excellent work of the Japanese and others, who found no proof of such a tuberculin reaction in animals. Although there may be and perhaps is a

certain degree of such action, many of the reactions resemble metallic poisoning, such, for example as salivation, severe pain and exfoliative dermatitis following large doses. As to the "sterilization" of tuberculous lesions, there is little established evidence of a direct effect on the tubercle bacilli. The opinion is now generally in favor of an indirect action on the body rather than a direct one on the parasites. Patients with disseminated bacilli without resistance are not affected at all favorably, which indicates a lack of bactericidal effect. There is therefore no need to adhere to the large and rather dangerous dosage advocated by the author. On the other hand, good results have been obtained by many others, without the objectionable reactions, by using smaller dosage. The indications, contraindications, types of reaction and various systems of dosage are rather well given and are useful as guides in treatment. The methods of dosage used by Permin and especially by Sayé afford a good plan to all those contemplating use of the drug. In the evaluation of the results of treatment, several authors are cited, but perhaps the most representative is that of Stub-Christiansen, who showed that 53 per cent of treated patients are able to work after one year, while only 37 per cent remain in that condition after five years. With certain reservations regarding the author's method of dosage, the booklet may be used as a guide in treatment with "Sanocrysin."

Walter Bradford Cannon: Exercises Celebrating Twenty-Five Years as George Higginson Professor of Physiology, October 15, 1931. Boards. Pp. 94. Cambridge: Harvard University Press, 1932.

In connection with the presentation of the portrait of Dr. Walter B. Cannon to Harvard and the celebration of his twenty-five years of service as professor of physiology, a beautiful souvenir volume has been issued. It includes the addresses made on the important day by Drs. Edsall, Alvarez, Howell and Lusk, the acceptance address of President Lowell, and a record of Dr. Cannon's service, together with a bibliography of his writings. The book is beautifully printed, contains a reproduction of the portrait, and will be appreciated by all those who know Dr. Cannon.

Gynäkologische Operationslehre. Von Hofrat Prof. Dr. Josef Halban. Paper. Price, 37.50 marks. Pp. 448, with 398 illustrations. Berlin: Urban & Schwarzenberg, 1932.

The author's aim in this book is to accomplish two purposes: to describe the technic of gynecologic operations and to point out the indications for these operations. As Halban emphasizes, it is frequently more difficult to know whether and when to operate than how to perform an operation. The purposes have been so well fulfilled that this book is one of the best books on surgical indications and technic ever published in any language. Because there are numerous different operations for many gynecologic conditions, Halban describes and illustrates the ones which he himself generally performs. For this reason the book is most valuable. There are few gynecologists in the world who can equal Halban's ability to perform vaginal operations. It is unfortunate that the large majority of gynecologists in this country, especially the younger ones, are unfamiliar with the technic of vaginal operations. The latter operations have a decidedly lower mortality and morbidity than laparotomies, and all gynecologists should learn the anatomy and technic of vaginal operations in order to give their patients the benefits of these operations. The author describes not only gynecologic operations but also operations on the bladder, ureter and kidney, the repair of hernias and the removal of the appendix, hemorrhoids and pulmonary emboli. The illustrations cannot be surpassed for their accuracy, clearness and instructiveness. Every gynecologist should obtain a copy of this book, even those who cannot read German, for there are enough illustrations to label this book an excellent atlas.

The Business Man and His Health. By Jesse Feiring Williams, M.D. Cloth. Price, $2. Pp. 175. New York and London: McGraw-Hill Book Company, Inc., 1932.

Dr. Williams has planned this book for people who work indoors. It is a brief book of common sense advice, written in simple but somewhat prosaic form. Since people who work indoors are much like other people except for the fact that they work indoors, the book is really a good book on personal hygiene for every one. Especially to be recommended is the chapter on the choice of a physician.

Medicolegal

Practice of Dentistry by a Corporation

(Parker v. Board of Dental Examiners of State of California (Calif.), 1 P. (2d) 501)

"Painless Parker Dentist," a corporation, was organized to "conduct, own, operate and control dental offices." E. R. Parker, one of its incorporators, a licensed dentist, changed his name to "Painless" Parker, by court decree. Apparently, the corporation never acted in any respect other than to appoint Painless Parker, the incorporator named above, as its "manager and chief surgeon." The corporation never paid a dividend nor had any assets or funds on hand. Shortly after the incorporation of "Painless Parker Dentist," the Associated Dental Supply Company was organized as a corporation to deal in all kinds of dental supplies. When proceedings to revoke Painless Parker's license were instituted, fourteen dental offices seem to have been operating in California by dentists using "the E. R. Parker system," all owned or leased by the Associated Dental Supply Company, but these offices were in turn "leased" by that company to the Painless Parker Dentist corporation. Notwithstanding this subleasing of these offices, however, the Associated Dental Supply Company seems to have dealt directly with the managers of these local dental offices, and these managers deposited all the receipts of their respective offices to the credit of the Associated Dental Supply Company. Painless Parker, the individual, seems to have supervised the operation of all the offices for the benefit of the Associated Dental Supply Company. He employed a licensed dentist as the local manager of each office, and each such local manager employed licensed dentists to perform all necessary dental operations. Painless Parker Dentist, the corporation, was apparently the lessee of these offices, and the term "Painless Parker Dentist" appeared on the doors, windows and letterheads, although later the term "dentists using the E. R. Parker system" was substituted. But Painless Parker, the man, managed these offices apparently for the benefit of the Associated Dental Supply Company.

Painless Parker's conduct was deemed unprofessional by the California board of dental examiners, and after notice and hearing it revoked his license to practice dentistry. Parker petitioned the superior court, city and county of San Francisco, to set aside the revocation, which the court refused to do. He then appealed to the district court of appeal, first district, division 2, California.

Section 11, Act 2048, Deering's General Laws, 1923, the dental practice act, declares the practice of dentistry to include the activities of any one "who manages or conducts as manager, proprietor, conductor, or otherwise a place where dental operations are performed." Section 13 of that act defines as unprofessional conduct "aiding or abetting any unlicensed person to practice dentistry unlawfully." The conduct of Parker, contended the board, was "unprofessional" in that he aided and abetted an unlicensed person, the Painless Parker Dentist corporation, to practice dentistry "by permitting, allowing and authorizing said corporation to conduct, own, operate, and control dental offices throughout the state . . . where dental operations were performed, and carry on the practice of dentistry therein." The board contended that conducting, owning, operating, and controlling dental offices constituted the practice of dentistry within the purview of section 11 of the dental practice act, *supra;* that a corporation cannot be licensed to practice dentistry; and that any licensed dentist who aids a corporation in performing any of the acts named above is aiding "an unlicensed person" to practice. Parker claimed, however, that the term "unlicensed person," as used in the prohibition of "aiding and abetting any unlicensed person to practice dentistry unlawfully," refers only to natural persons, who might be licensed under the act, and not to a corporation owning or operating a dental office, and that the provisions of section 11 are unconstitutional so far as they purport to prohibit an unlicensed person from managing the purely business or economic affairs of a dental office.

Bearing in mind, said the district court of appeal, that the ultimate purpose of the dental practice act is to bring about and insure skill and proficiency in the practice of dentistry,

section 11 as construed by the board would be unconstitutional, because it would place unreasonable restrictions on the conduct of a lawful business. To support this statement the court quoted from *State* v. *Brown*, 37 Wash. 97, 79 P. 635, decided in 1905. In that case the Supreme Court of Washington had under consideration a provision of the dental practice act of Washington, which made it a misdemeanor for an unlicensed person to "own, run, operate or cause to be operated, or manage a dental office." The Washington court said, in part, as follows:

> To own and manage property is a natural right, and one which may be restricted only for reasons of public policy, clearly discernible. . . . But, we are unable to say or perceive that the health, moral, or physical welfare of the public, or any of the personal or property rights of its individuals, are endangered by the ownership and management of a dental office, so long as those employed therein to do the actual dentistry work are qualified and licensed as by law required.

The Supreme Court of Washington in its exposition of the supposed unreasonableness of the Washington statute described the hypothetical case of a supposed widow of a licensed dentist, who assumed control and management of the business of the office of her deceased husband, and who, though she employed none but licensed dentists to perform the dental work, would be chargeable under the strict terms of the act with practicing dentistry without a license. Other illustrations, said the California district court of appeal, might be added. "The manager or proprietor of a place where dental operations are performed," said the court, "would include the manager and owner of every hospital and clinic permitting such operations, the many charitable agencies maintaining clinics, the infirmaries and guilds maintained and operated by the students in universities and colleges, the many dental clinics maintained by parents' organizations for the benefit of school children, as well as the owners and managers of buildings where such operations are performed."

The California court found further authority for its holding, in *Messner* v. *Board of Dental Examiners*, 87 Calif. App. 199, 262 P. 58, decided in 1927, in which the court of the third appellate district annulled an order suspending the license of a dentist on the charge that an unlicensed person was the "manager" of his office. In that case, the court said, in part, as follows:

> Cohn had charge of the purely business end of the dental office, . . . but there is no evidence that he had or exercised the slightest control or direction of the professional work performed in such office. . . . A reasonable construction of the quoted provisions of the statute appears to be that, to come within the terms thereof, one must in some manner, to some extent, directly or indirectly, control or direct some professional service of the kind that dentists are licensed to render.

The court found itself in full accord with and quoted from *State Electro-Medical Institute* v. *State*, 74 Neb. 40, 103 N. W. 1078, decided in 1905, as follows:

> There was no necessity of legislation to prohibit corporations, as such, from practicing medicine. It is impossible to conceive of an impersonal entity "judging the nature, character and symptoms of the disease," or "determining the proper remedy," or giving or prescribing the application of the remedy to the disease. Members of the corporation, or persons in its employ, might do these things, but the corporation itself is incapable to do them. The qualification of a medical practitioner is personal to himself. The intention of the law is that one who undertakes to judge the nature of a disease or to determine the proper remedy therefor, or to apply the remedy, must have certain personal qualifications; and, if he does these things without having complied with the law, he is subject to its penalties. Making contracts is not practicing medicine. Collecting the compensation therefor is not practicing medicine, within the meaning of this statute. No professional qualifications are requisite for doing these things.

It follows, said the California court, that when the California legislature declared it to be unprofessional for a licensed dentist to aid an unlicensed person to practice dentistry, it did not contemplate aid to a corporation, which itself could not become licensed under the act and which could do no more than conduct the business side of the office. Since a corporation cannot practice dentistry, Parker could not have aided it to practice and could not have been guilty of unprofessional conduct in this respect as charged by the board.

The board of dental examiners charged further that Parker had been guilty of unprofessional conduct in that he aided an unlicensed person, Ramona McShane, to practice dentistry unlawfully by permitting her to participate in the profits of the dental offices operated by "Painless Parker Dentist, a corporation." The board, to support this charge, introduced evidence that some years ago the Associate Dental Supply Company executed a trust agreement and sold trust certificates in small denominations. Ramona McShane purchased a number of these certificates, and dividends were later paid to certificate holders. As the Painless Parker Dentist corporation leased offices from the Associated Dental Supply Company, the board, after its hearing in the case, held that Ramona McShane participated in the profits of the Painless Parker Dentist corporation that she therefore practiced dentistry unlawfully, and that Painless Parker aided and abetted her in so doing. But, said the district court of appeal, it would be just as reasonable to hold that every stockholder of a bank which has lent money to the owner of a building in which some dentist has practiced without a license is an aider and abetter in the unlawful practice of dentistry. To interpret the statute as contended for by the board would make it unconstitutional for the reasons stated above. If, however, the statute is given a reasonable and constitutional interpretation, the evidence demonstrates that Ramona McShane was not practicing dentistry within any sound construction of the act.

The board held also, after its hearing, that Painless Parker had been guilty of unprofessional conduct in that he practiced under an assumed or fictitious name in the use of the term "Painless Parker Dentist." But, said the court, the name Painless Parker Dentist was not fictitious. Parker was practicing under the name given him by decree of court, which also was the name under which he was licensed to practice by the board.

For the reasons stated above, the order of the California board of dental examiners suspending Parker's license to practice dentistry was reversed.

Society Proceedings

COMING MEETINGS

American Ophthalmological Society, New London, Conn., June 27-29. Dr. Emory Hill, 501 East Franklin Street, Richmond, Va., Secretary.

Montana, Medical Association of, Miles City, July 13-14. Dr. E. G. Balsam, 208 North Broadway, Billings, Secretary.

Pacific Northwest Medical Association, Spokane, Wash., June 27-29. Dr. Frederick Epplen, 1215 Fourth Avenue, Seattle, Secretary.

Western Branch of the American Urological Association, Portland, Ore., July 1-2. Dr. F. S. Dillingham, 548 S. Spring Street, Los Angeles, Secretary.

Wyoming State Medical Society, Rock Springs, July 18-19. Dr. Earl Whedon, 50 N. Main Street, Sheridan, Secretary.

ASSOCIATION OF AMERICAN PHYSICIANS

Forty-Seventh Annual Meeting, held at Atlantic City, N. J., May 3 and 4, 1932

The President, DR. THOMAS B. FUTCHER, Philadelphia, in the Chair

Use of the Matthews Oscillograph in Phonocardiography

DRS. WILLIAM J. KERR, JOHN J. SAMPSON, JOHN B. LAGEN and FREDERICK KELLOGG, San Francisco: The advantages of studying heart sounds by graphic means are as follows: 1. Permanent records are available for comparison. 2. Confused rhythms may be analyzed. 3. Detailed study of pitch, time and intensity of sound elements is possible. 4. Sounds normally inaudible may be recorded and studied. 5. Sounds may be analyzed from a different group of criteria in special relationship of pitch and intensity. The methods used condenser microphones and various types of rigid electroschemes, use of the Einthoven string galvanometer in series with a carbon particle or electromagnetic microphone, and the Einthoven galvanometer in series with an electron tube amplifying circuit and electrical filter, as well as an electromagnetic microphone. Recently Sell, Duchosal and others have used condenser microphones and various types of rigid electromagnetic oscillographs with natural periods higher than those of the Einthoven galvanometer with customary string lengths. Other types of oscillographs, particularly the cathode ray oscillograph and the short string Einthoven galvanometer, have been developed for other purposes and not yet applied to phonocardiography. Our purpose in this presentation is to show illustrations of the character of records taken with a Matthews

electromagnetic oscillograph with a high natural period and an electrical amplifying and filtering mechanism (the Western Electric Company's IA electrical stethoscope) as transmitted from a solid medium conducting electromagnetic microphone. The results obtained are favorably comparable to the records published by any of the other methods with a recorded range from 64 to 2,048 vibrations a second. The technic is simple and rapid, with or without simultaneous electrocardiograms.

DISCUSSION

DR. F. N. WILSON, Ann Arbor, Mich.: I should like to ask about the microphone, whether it is capable of responding accurately to vibrations of very high frequency. Some years ago Dr. H. P. Williams, working with the Western Electric Company on the electric stethoscope, thought that the record of the galvanometer as showing response to high frequencies would not be any good unless the microphone was corrected. He felt that it did not respond accurately enough to sounds of very high frequencies.

DR. WILLIAM J. KERR, San Francisco: We have been able to reproduce tuning fork vibrations of 2,048 frequency with a fair degree of accuracy, but this tracing does not enlarge very well on the slide. Later we hope to send some of our results to Dr. Wilson for comparison.

Vaccine Therapy in Rheumatic Cardiovascular Disease

DRS. W. D. STROUD, ALBERT W. BROMER and J. ROSWELL GALLAGHER, Philadelphia: These studies are based on ten years' observations in the Children's Heart Hospital in Philadelphia, which cares for children suffering from severe rheumatic cardiovascular disease. Treatment has included removal of foci of infection, removal from home environment, possible removal of familial contagious factors, care, rest and sufficient diet. The results have been disappointing. First of all, the follow-up results were unsatisfactory. Of 405 children, we have been able to follow up completely only 64 per cent. Thirty-six per cent have been lost sight of. Results in the 64 per cent were disappointing. Of these, 34 per cent died uncompensated, at the hospital or at home. Thirty per cent improved sufficiently to continue at work or at school. We knew that other workers had unsatisfactory results also and we wondered whether it would not be better to spend our funds on sending the children to Porto Rico or to Florida, rather than on research work. We were interested in Swift's work on the hyperergy of these children to streptococci, and we studied how to make them hyposensitive. We divided the children into three groups, as regards similarity of age. Twenty-five were under 17 years of age. We divided these into groups as to hypersensitivity to streptococci, and also as to the extent of cardiovascular damage and functional disability. Treatment also was grouped. Group 1 received the triple streptococcus vaccine of Swift in weekly injections; group 2 received triple typhoid vaccine; group 3 was used for control. Our method was to begin with a dose of from 50,000 to 100,000 and work gradually up to doses of 25 million. The triple typhoid vaccine could not be raised above 15 million on account of severe reactions. The visiting nurse went to the home of the patient to follow up the reactions and to fill in the questionnaire. There were more severe reactions in the triple typhoid group than in the other. Exacerbations often seemed to be delayed and were apt to appear in March. We wondered whether this could be attributed to seasonal influence. Our conclusions were that we must be very cautious in determining the results of the treatment. We feel it would be better to treat only a small group, so that each individual case can be followed up. We felt that there were no harmful results to be observed, and after consultation with Dr. Swift we feel justified in continuing the vaccine therapy. We intend to use younger individuals and to give the triple streptococcus vaccine intravenously.

DISCUSSION

DR. HOMER F. SWIFT, New York: In discussing this interesting report, one must realize the difficulty in evaluating the effect of any therapy in this disease, especially over such a limited period. Recently Dr. May Wilson has reanalyzed the data on the condition of the rheumatic children at the New York Nursery and Child's Hospital. In a report made before this association two years ago, a group of about 80 children vaccinated intravenously during a period of two years had a distinctly lower incidence of relapses than an unvaccinated group of similar size. Vaccination was then stopped for about two years; and recently the old vaccinated group has shown a higher incidence of recurrences than the nonvaccinated. At least two explanations of this phenomenon are applicable: 1. Relative freedom from relapses may be followed by a greater susceptibility. 2. In emerging from a condition of relative immunity, or hyposensitiveness, there may be a phase of hypersensitiveness.

Myocardial Failure Due to Trichinosis

DRS. CARL V. WELLER, Ann Arbor, Mich., and MILTON SHAW, Lansing, Mich.: In 1865, Kornblum noted the occurrence of a marked parenchymatous degeneration in the heart of a patient dying of trichinosis. He found millions of trichinae in the skeletal muscle but none in the heart muscle. In the latter there was probably an active defensive process characterized by a large number of eosinophils. With one exception (Frothingham in 1906 described what he believed to be an embryo in heart muscle) there have been no reports of trichinae found in heart muscle fibers. This led to the view that there was a toxic substance found in the body which was carried through the blood stream. We have studied a patient brought to the St. Lawrence Hospital. His illness, which had lasted six weeks, commenced with diarrhea; he had fever, night sweats and muscle pains. On admission he was nearly moribund. He had dyspnea, cyanosis, edema and feeble pulse with a rate of 136. He died before anything could be done. Necropsy showed an enormous number of trichinae in the stage of encystment in the skeletal muscles. The heart muscle showed no embryos but a marked diffuse myocarditis, both a focal and diffuse type of the process. Staining showed a large number of eosinophils. Studies by Graham on rats showed that from eight to fourteen days after infested meat has been eaten, embryos can be demonstrated in the heart muscle. The fact that they are found in every situation gave rise to the belief that they reach the myocardium but are promptly disposed of. Weiss made an elaborate clinical study of the disease and called attention to the edema phenomena that occurred. Facial edema in the third week was mostly toxic from the infected muscles. In the fourth or fifth week it was largely inflammatory. In the sixth week the edema appeared in the dependent portions of the body as a result of the failing myocardium. Studies show that fatal cases are not common. There are many sublethal cases and also subclinical cases. It seems to be a curious condition if the heart disposes of the parasites. There is an analogy to syphilis. The spirochetes can be demonstrated in the aorta, but it is difficult to demonstrate them in the myocardium. It seems as if a defensive mechanism might be supposed which disposes of the parasites.

DISCUSSION

DR. THOMAS ORDWAY, Albany, N. Y.: The authors have spoken of these cases of trichinosis presenting myocardial symptoms. I will call attention to cases of trichinosis with the patients dying of pneumonia. I have had two such cases. There is often a very low blood sugar in cases of trichinosis. I am wondering whether the glycogen content of the heart muscle is different from that of the skeletal muscle because of its constant activity. This may have some bearing on the conditions found in the heart muscle.

DR. GEORGE BLUMER, New Haven, Conn.: I should like to ask the authors whether it is essential to assume that the parasites are destroyed. May they not, by passing through, do sufficient damage to lead to the lesions? There is an analogy to the infection in the chicken. One can infect the chicken, but the parasites do not remain in the muscle. If one examines the voluntary muscle in trichinosis the muscle shows areas of degeneration, but there are also areas of degeneration in which no trichinae are found.

DR. CARL V. WELLER, Ann Arbor, Mich.: I do not think that the myocardial weakness predisposes to the pneumonia under the circumstances. We had no opportunity to make glycogen estimations, but I think that this is a point of great interest. I do not know whether this reaction is evidence of a temporary condition or whether it represents evidence of actual destruction. I incline to the latter view because of the amount of destruction and because of the cellular reaction.

In examining the skeletal muscle we found many areas of degeneration, but, in serial sections, areas of infiltration lay above and below the areas where the parasite was present in the muscle. The very young trichinae are exceedingly small and translucent and it is exceedingly difficult to demonstrate them in the early stage in areas rich in eosinophils.

Experimentation on the Heart in Hyperthyroidism

DR. E. COWLES ANDRUS, Baltimore: Cardiac manifestations of hyperthyroidism are prominent manifestations of the disease. It is impossible, however, to correlate the severity of the heart lesion with the other clinical signs of the disease. The cardiac manifestations may be so prominent as to mask the hyperthyroidism. On the other hand, the patient may perish in the flames of a hyperthyroid crisis without showing any myocardial insufficiency.

We studied a series of 200 cases of goiter at the Johns Hopkins Hospital. We also made a study of the hearts of animals receiving thyroxine. These 200 clinical cases were taken care of first in the medical service, and later the patients were sent to the surgical wards. Exophthalmic goiter was present in 158 cases. The adenoma cases numbered 42. The latter patients were of greater age and had had symptoms for a longer time. In the exophthalmic cases the cardiac symptoms were related to the hyperthyroidism. An average time of twenty months was noted. In the adenoma class there had been goiter for several years and cardiac manifestations for years. In one case, cardiac failure was associated with symptoms for twenty-six months.

In regard to the age factor, we found that myocardial insuficiency was related to the higher decades. There were only nine patients with cardiac failure under 40 years of age. In one patient who died, Aschoff bodies were found in the myocardium. One patient, a Negress, aged 26 years, was found to have syphilis.

As regards experimental work, it is impossible to produce exophthalmic goiter in animals on account of the position of the thyroid. In experimental animals there is a latent period analogous to that seen in surgical patients before the postoperative storm. In animals under thyroxine the heart is more rapid than in normal animals. Depletion of the glycogen reserve and increase in lactic acid concentration occur. The glycogen drops from a normal of 314 to 116 mg. after the animals receive thyroxine. This is comparable to the glycogen changes in skeletal muscle. It is found that increased metabolism throws an added load on the heart, which is the cause of cardiac failure in hyperthyroidism. The heart, however, is not singled out or uniquely poisoned by thyroxine. The heart muscle merely partakes of the general metabolic upheaval set up by the hyperthyroidism and suffers depletion of the glycogen reserve. Thus, first the excessive load and secondly the metabolic changes in the muscle bring into prominence the cardiac manifestations of hyperthyroidism. This may lead, especially in older persons, to cardiac insufficiency, because the load thrown on the myocardium exceeds the limits set up by its own metabolism.

DISCUSSION

DR. E. B. KRUMBHAAR, Philadelphia: The clinical and electrocardiographic approach to this study is of interest. Some years ago I studied a number of cases of toxic goiter before and after surgical treatment. Many cases showed ventricular preponderance. Signs were about equally divided among the patients of right and of left ventricular preponderance. After surgical treatment, examination showed that examples of increased activity in the right ventricle had disappeared; but signs of preponderance in the left ventricle showed very little change postoperatively. This seems to show that signs of right ventricular preponderance may be due to overload or there may be some other factor present, possibly not connected with the hyperthyroid condition, which causes greater and more prolonged change in the left ventricle.

DR. J. H. MEANS, Boston: Dr. Andrus has gone a long way toward settling the long drawn out controversy as to whether the heart is successfully compensated. The weight of clinical evidence is that the heart tolerates this burden of work with success in thyrotoxicosis. We had one patient with thyrotoxicosis under observation seventeen years and by all examinations there was no evidence of pathologic cardiac changes at all. I think the heart is not specifically poisoned but carries on very well. If a patient has some cardiac burden and then gets a thyroid condition there is, of course, a double burden, and decompensation is apt to occur.

DR. W. S. THAYER, Baltimore: The extraordinary capacity for cardiac recovery evidenced by some patients without anything besides thyrotoxicosis is remarkable. A woman who in 1909 had an extreme degree of right-sided insufficiency, auricular fibrillation, distended veins and general dropsy then had a subtotal thyroid removal. Her general condition was entirely reestablished, except for the auricular fibrillation. After a time she developed a slight hypothyroidism. She was given small doses of thyroid. That woman is alive and well at the present time with a slow, normal, but irregular pulse. Nothing in the history was found except the thyrotoxicosis. She was able to live a normal life after the operation. I have seen other cases not so marked, but this instance makes one feel that there should not be, at least in some instances, any great disturbance of the heart muscle.

DR. W. J. KERR, San Francisco: In California my associates and I have been interested in cases of hyperthyroidism with cardiovascular manifestations. We have observed auricular fibrillation in one third of the toxic cases. We have seen frequent changes in the liver going on to focal or diffuse necrosis. The heart muscle has shown marked changes in only a few cases. In other structures, such as the skeletal muscles, we have not been able to demonstrate these changes. This study was limited to the ribbon muscles of the neck. Dr. Naffziger, in our hospital, has found degeneration and hypertrophy of the extra-ocular muscles in patients with marked exophthalmos. Dr. Andrus, two years ago, reported reduced glycogen and increased lactic acid content of the muscles in experimental hyperthyroidism. Dr. Anderson, in my department, has studied the lactic acid content in the blood. In the thyrotoxic patient the lactic acid is normal during rest but is greatly increased during exercise. In the normal individual, either it does not go up or it returns very quickly to the normal level. A more careful study of those structures in which the glycogen content is normally high may reveal structural changes in the most severe or more prolonged cases of thyrotoxicosis.

DR. E. COWLES ANDRUS, Baltimore: I should like to emphasize one point which Dr. Means raised, and that is that any result as regards the heart muscle must be determined by the soil on which hyperthyroidism is implanted. One cannot expect the same response from all individuals. One has to consider the age of the patient and the development of the disease. A description of the myocardial changes must be approached with caution. Dr. McEachern examined a group of patients with hyperthyroidism at Johns Hopkins Hospital and also a control group of patients dying of other conditions. There were similar changes in the hearts of the control group, and to a similar degree.

Studies on the Circulation in Hypertensive Cardiovascular Disease by the Use of the Injection Method

DRS. W. DE B. MACNIDER, Chapel Hill, N. C., and JOHN WALKER MOORE, Louisville, Ky.: Cardiocirculatory dynamics have been hitherto considered of a mysterious nature and have given rise to conflicting theories. Our studies have been made with the idea of throwing some light on this lack of unanimity among workers. In the first place we have made a study of the normal man, as a basis from which to compare the results in hypertension. The studies were confined to a group of cases admitted to the City Hospital. The cardiac cases studied were divided into four groups: severely decompensated, moderately decompensated, compensated, and undecompensated hypertensive cases. The patient was placed in a recumbent position on the edge of the bed, and injections of scarlet red were given into the circulation.

The Rôle of Arterial Thrombosis in Visceral Disease of Middle Life

DR. LEWIS A. CONNER, New York: Whereas thrombosis in the arteries of the heart and of the brain is known to be

common and is easy of clinical recognition, almost nothing is known concerning the symptoms of arterial thrombosis in the abdominal viscera. Nevertheless the frequent occurrence of degenerative changes in the arteries of the pancreas, kidneys, spleen and mesentery indicate that thrombosis in these vessels cannot be rare. The failure to recognize attacks of arterial thrombosis in the abdominal organs must be due in part to the inherent difficulties of diagnosis but is almost certainly due partly to one's failure to have the possibility of such attacks in mind. One may attempt to construct a framework of diagnosis for arterial thrombosis in the kidney, pancreas, spleen and mesentery by utilizing certain symptoms associated with thrombotic infarction in the heart (fever, leukocytosis) and those which result from infarction due to embolism in the kidney, spleen and mesentery. It seems probable that, when both internists and pathologists begin seriously to seek for evidences of such thromboses and to correlate their observations, the difficulties of diagnosis will be found to be not insurmountable and the features of the respective clinical pictures will gradually emerge from the present obscurity much as have those of the diagnosis of coronary thrombosis.

DISCUSSION

DR. R. C. LEVY, New York: I would suggest that following the appearance of this paper by Dr. Conner there will be an increase in the statistical incidence of visceral thrombosis reported. Medical diagnosis depends on such incentive. Dr. Conner has brought this question to our attention before. An example of this notice was the diagnosis of angina pectoris, which was first made in 1768 and was recognized thereafter. In the decade 1920-1930 at the Presbyterian Hospital in New York it was interesting to see the increase in the number of diagnoses of coronary artery disease, including thrombosis. In the pathologic records the incidence was noted as 12 per cent, but on the other hand in the clinical files during that time there was an increase of 400 per cent in the frequency of this diagnosis. Following the publication of papers by Herrick and others, the interest in these various conditions was aroused, and clinicians became more alert to recognize them and record the diagnosis. Dr. Dublin, the statistician of the Metropolitan Life Insurance Company, received a letter from the Bureau of Vital Statistics in Washington stating that in the decade 1920-1930 the frequency of this diagnosis had increased 100 per cent.

DR. EMANUEL LIBMAN, New York: Among other things of interest, Dr. Conner has brought up an important consideration; namely, the question of the possible relationship of coronary thrombosis to changes in the blood. I am strongly in favor of this conception. In fact, in 1919, in the course of a paper presented to the association, I took up this subject and stated that I felt that patients suffering from coronary thrombosis had a tendency to thrombosis in general. I drew attention to the frequency of thromboses elsewhere before and after an attack of coronary thrombosis, as, for example, in the arteries of the lower extremities, in the cerebral arteries, and in veins. For some years I have called this tendency "thrombophilia," and I have considered that while the thrombosis may at times originate from infectious processes and its incidence be influenced by the condition of the vessel wall, the process is mainly of metabolic origin, having a relationship to what are called "gouty conditions." Incidentally, I am in favor of dropping the term "gout." Recently I have found that Mendel introduced the term "thrombophilie" for the same condition and that von Recklinghausen stated that there occurs an individual tendency to thrombosis and that it had a "relationship to such metabolic disturbances as diabetes and gout." The problem of coronary thrombosis is in the main a metabolic one. It is urgent that the chemical disturbances be studied and that a great concerted effort be made to prevent coronary thrombosis. While much study is being made of this disorder, I believe the most important lines of investigation are not being at all stressed. At the risk of being considered facetious I am tempted to write a paper entitled "The Present-Day Neglect of the Study of Thrombosis of the Coronary Arteries." Dr. Levy has taken up the question of the incidence of coronary artery thrombosis formerly and now. I have the impression that the frequency is greater at the present time—and I have been studying the condition for over thirty years. In this connection the study of the incidence of cerebral thrombosis may be of great significance. Is cerebral thrombosis less frequent than it was twenty or thirty years ago? Another important question is, Does coronary thrombosis occur at an earlier age, and, if so, are those who formerly died at an advanced age of cerebral thrombosis dying of coronary thrombosis at an earlier period of life? If this should prove to be the case it would be another example of what James Paget designated "errors in the chronometry of life."

DR. J. H. MEANS, Boston: Thrombosis of the pulmonary artery is a very rare condition but it exists. I had a case of complete thrombotic occlusion of the right pulmonary artery, but on account of the fact that there was an unusually rich collateral circulation through the bronchial artery the patient was able to carry on. Cyanosis and unexplained signs put us on the track of something in the pulmonary circuit. There has been a case reported in which the roentgenogram showed an oblong shadow projecting into the pulmonary artery.

DR. A. R. DOCHEZ, New York: During infection of the respiratory tract in individuals with arteriosclerosis there is a tendency for thrombosis to occur. Whether this is due to diffusion in the circulatory tract is not clear. But, as one goes over records, there is correlation with minor infection. This is not frequently mentioned, but it should be noted as often as it exists.

DR. ALFRED E. COHN, New York: Last year Ehrich and I published the report of an investigation on the coronary arteries. We examined the coronary arterial system by decades in persons living a normal life. Our method of study was to analyze changes that took place in the intima of the coronary arteries. We found that the branches of the right and the left coronary artery were different in the results as regards time of life. The ramus descendens anterior was often well advanced in arteriosclerosis in the fifth decade. The ramus descendens posterior was not affected till the seventh decade. There are systemic changes that take place in these lesions which must be considered in the whole picture.

DR. W. S. THAYER, Baltimore: Thrombophilia is a condition that is commonly associated with thrombosis of the veins or the arteries. It may or may not be related to infection. There are some cases of spontaneous venous thrombosis, and sometimes of arterial thrombosis. I saw a marked example in a woman who had multiple thrombosis, both arterial and venous, all over the body. Dr. Cohn, who was studying the coagulation of the blood, found a lower antithrombin content than he had ever seen. I think this is a condition which will have to be recognized.

DR. LEWIS A. CONNER, New York: As far as Dr. Libman's views are stated, I am in entire sympathy with him. I think that there are probably subtle changes in the blood mixture which determine changes in the arteries. I do not think that evidence of this has yet been found but rather evidence as to the relation of arteriosclerosis and thrombosis. While there are cases occurring early in life, in the long run the relation between thrombosis and arteriosclerosis is striking. What is needed is accurate detailed study of individual cases. If one goes over the literature, the facts given are scanty and so many details are lacking that there is little help. Another difficulty is failure of cooperation in postmortem studies. Most of these abdominal cases go on to recovery. These cases must be studied in great detail, with years of confirmation by necropsy study. It is not an easy study but may prove to be quite possible if the necessary steps are taken.

Some Studies on the Mechanism of Diuresis in Patients with Congestive Heart Failure

DRS. GEORGE HERRMANN, C. T. STONE and E. H. SCHWAB, Galveston, Texas: We should like to stress the importance of edema as a clinical therapeutic problem. The methods and mechanisms of its elimination seem to warrant further studies. The spontaneous diureses of rest in bed with limited low protein, salt and water intake were noted to occur as a rule, if at all, within the first three days. Digitalization seemed to act in much the same way apparently as a result of increased general circulatory efficiency and with that improved renal glomerular circulation. The mode and point of action of the so-called specific diuretics, the xanthines and the mercurials

in the accomplishment of profuse diuresis in edematous patients with congestive heart failure are still unsolved questions.

We have attacked the problem of the dissipation of cardiac edema by attempting to calculate the amount of glomerular filtration and the amount of tubular reabsorption per minute before, during and after an acute profuse diuresis. We followed the method of Rehberg, in which 5 Gm. of creatinine is ingested and the blood levels and urinary percentages are followed periodically and the ratio taken as the index of concentration. This is true if creatinine is a totally nonthreshold substance filtered entirely through the glomerular tufts and not at all absorbed by the tubular epithelium as it is assumed to be. This index of concentration multiplied by the minute volume of urine (U) gives the figure which is taken to represent the amount of filtrate per minute (F). This filtration (F) minus the urine volume per minute (U) is taken to represent the amount of fluid reabsorbed (R) in the tubules. The simultaneous blood and microquantitative urine analyses for chlorides and urea yield data on which the amounts of these substances filtered, reabsorbed and excreted in the urine can be calculated before, during and after the diuresis.

We have made twelve such studies in patients with edema from heart failure. In four, digitalis bodies were used by mouth, intramuscularly and intravenously to produce diuresis; in four, theophylline ethylenediamine, 0.96 Gm. intravenously, and in four mersalyl, 0.2 Gm. intravenonsly. The diuresis of rest, digitalization and theophylline is accomplished by an increased filtration along with some decrease in reabsorption. Such results can be explained on the basis of increased glomerular circulation and the consequent more rapid passage of the blood from the tuft through the tubular plexus, thereby decreasing minute plasma volume reabsorption. In mersalyl diuresis, on the other hand, there is no increase in filtration but definitely a sharp decrease in reabsorption to account for the increased urinary output. This is apparently due to a change produced in the cells of the tubular epithelium by the passage of mercury through them. Interesting combination effects were obtained suggesting the persistence of effects. The effects of diuretics seemed to be primarily on the kidney rather than in the tissues.

The blood and urine chemical analyses suggested that the chlorides first lost through the kidney were mobilized rapidly and in great quantity from the tissues along with other electrolytes, urea and water, and were filtered through the glomeruli, diffusing back or being reabsorbed only incompletely, and therefore being carried out along with the desired increased fluid output.

Experimental Observations on Diuretics

DRS. HENRY A. CHRISTIAN and EDWARD A. BARTRAM, Boston: Various diuretics have been injected into the left renal artery of dogs under anesthesia produced by the intraperitoneal injection of diallylbarbituric acid. The urine has been collected and measured separately from each ureter.

With merbaphen, mersalyl and theophylline sodio-acetate, a small dose in the left renal artery causes a diuresis from the left kidney and no effect on the flow of urine from the right kidney. A somewhat larger dose causes an increase in flow from the left kidney, and a diuresis from the right less than that occurring from the left. As the dose is increased further, the flow from the left kidney begins to decrease while that from the right continues to increase. With still larger doses, diuresis from the left kidney ceases while that from the right kidney continues to increase. These results, which were found with an occasional exception, indicate that these mercurial and theophylline diuretics have a direct action on the kidney.

With theobromine sodiosalicylate and caffeine citrate, usually there is approximately the same flow of urine from each kidney when the diuretic is injected into the left renal artery, the diuresis increasing to an equal degree from each kidney as the dose of the diuretic is increased. These results harmonize with but do not prove that the theobromine and caffeine diuretics have an extrarenal effect.

The conclusion seems justified that diuretics, as represented by those used by us, may be divided into two groups with different pharmacologic action.

The Effects of Diuretics on Water and Salt Metabolism

DR. HERRMANN L. BLUMGART, Boston: In studies dealing with the clinical effects and mechanism of diuretics, an attempt was made to influence the examination of the urine in the effort to render it as constant as possible. The patients were placed under strict metabolic control. The time and amount of the dosage were uniform. Urine was collected seven times daily. The specimen was analyzed for sodium, potassium, calcium, ammonia, phosphates, sulphates and acidity. The stools were analyzed. A definite daily curve of excretion was found the best method for obtaining effects of the diuretics. The studies were begun on a group of normal subjects in whom the diuretics caused increased excretion of the urine as to both volume and constituents. No changes occurred in the ammonia, acidity or inorganic phosphates and sulphates. In the normal subject it was found that 90 per cent of the body fluids excreted were extracellular and 10 per cent intracellular. The mercury diuretics had more marked effects than the xanthine diuretics. If the dose was doubled, the effect was trebled. Tubular reabsorption ran parallel to the increased diuresis. Diuresis may take place without the glomerular filtration being affected. Another group of subjects studied were patients with cardiac decompensation. The drugs used were theobromine sodiosalicylate, mersalyl, merbaphen and theophylline. In this group of patients, instead of 10 per cent intracellular body fluid being affected, the proportion was 30 to 40 per cent.

DISCUSSION ON DIURETICS

DR. J. C. AUB, Boston: I should like to ask Dr. Herrmann what he terms defective reabsorption.

DR. NORMAN M. KEITH, Rochester, Minn.: The remarks of Drs. Herrmann, Stone and Schwab as to the comparative diuretic action of digitalis, caffeine derivatives and mercury are of clinical significance. In their experience, and in that of many others, digitalis is less effective than mercury and caffeine, and this fact needs to be emphasized. The results of Drs. Christian and Bartram with mercury show the importance of dosage and the undoubted toxicity of large doses to the kidneys. Dr. Blumgart has compared the reaction of diuretics in the normal subject and patients with edema under controlled conditions. Such a method has been distinctly productive for several years. As Dr. Blumgart has pointed out, the diuretic action in the normal subject and in cases of edema may be different. His suggestion is that this difference may be due to the chief effect being exerted in either the intracellular or the extracellular fluid. This question must be studied further to determine whether such differences are peculiar to distinct types of edema states.

DR. W. DEB. MACNIDER, Chapel Hill, N. C.: Drs. Christian and Bartram said that they studied the effects of different types of diuretics in different types of renal lesions. Did they carry this work out in animal experimentation as well as clinically?

DR. GEORGE HERRMANN, Galveston, Texas: We used filtration to determine the creatinine ratio in the urine and in the serum. Reabsorption was shown by the difference between the concentration in the urine and the blood creatinine. For each of the substances used, we estimated the level of the chloride and urea in the blood in percentages. We subtracted the filtered amount in the excreted urine and this gave us the reabsorbed amount.

DR. HENRY A. CHRISTIAN, Boston: In answer to Dr. MacNider, I have not done experiments on any but normal animals. The effect of mercurial diuretics is most injurious to the kidneys of animals, as judged by the albuminuria which is always produced in dogs to a marked degree. It is curious that this should be so when there is most diuresis, but it is due to increase in reabsorption.

DR. H. L. BLUMGART, Boston: Edema varies in different types of the disease. In the cases studied the percentage of intracellular fluid was normal, but in some cardiac patients the percentage of the intracellular fluid was much greater as compared with the extracellular fluid. Intracellular edema is not always present. It depends on the stage of the pathologic changes present in the cardiac disease.

(To be continued)

Current Medical Literature

AMERICAN

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Titles marked with an asterisk (*) are abstracted below.

Alabama Medical Association Journal, Montgomery

1: 341-384 (March) 1932

Surgical Treatment of Pulmonary Tuberculosis. F. K. Boland, Atlanta, Ga.—p. 341.

Agranulocytosis: Report of Case. J. D. Durden, Anniston.—p. 346.

Glycosuria. G. O. Segrest, Mobile.—p. 348.

Varied Manifestations of Allergy. C. K. Weil, Montgomery.—p. 351.

Preoperative Considerations of Prostatectomy. J. U. Reaves, Mobile. —p. 356.

American Journal of Diseases of Children, Chicago

43: 533-802 (March) 1932

Physical Analysis in Adolescent Problem. T. W. Todd, Cleveland.—p. 533.

*Effect of Vitamin B Complex on Resistance of Rats to Enteritidis Infection. J. R. Ross and Elizabeth Chant Robertson, Toronto, Canada. —p. 547.

Some Factors Influencing Fecal Flora of Infants. J. R. Gerstley, Katharine M. Howell and Beth Reynolds Nagel, Chicago.—p. 555.

*Substances Involved in Coagulation of Blood of the New-Born: II. Effect of Ultraviolet Radiation and Viosterol. H. N. Sanford, T. H. Gasteyer and Lois Wyat, Chicago.—p. 566.

Id.: III. Effect of Withholding Protein and Fat from Diet. H. N. Sanford, H. J. Morrison and Lois Wyat, Chicago.—p. 569.

*Serum Therapy in Meningococcus Meningitis. G. M. Lyon, Huntington, W. Va.—p. 572.

The Infant Ward. J. Brennemann, Chicago.—p. 577.

Roentgenographic Changes in Thorax of Normal Premature Babies: Daily Roentgenographic Study of Fifteen Normal Premature Babies During First Fourteen Days of Life. C. A. Weymuller, A. L. L. Bell and A. A. Trivilino, Brooklyn.—p. 585.

*Atelectasis in the New-Born. Ethel C. Dunham, New Haven, Conn.—p. 594.

*Esophageal Obstruction: Clinical and Experimental Study of Its Effect on Life and Growth. J. Stokes, Jr., and T. S. Wilder, Philadelphia. —p. 604.

*Migratory Peritonitis: Clinicopathologic Study of So-Called Hematogenous Peritonitis in Children. S. A. Wile and O. Saphir, Chicago. —p. 610.

*Pyuria and Pyelitis: Influence of Exsiccosis on Their Experimental Production. C. C. Stewart, Rochester, Minn.—p. 632.

Vitamin B Complex.—Ross and Robertson placed a group of young rats on a vitamin B-free diet, and a second group on a similar diet plus 6 per cent dried brewers' yeast. Both groups were infected by mouth with an enteritidis organism. Of fifty-three rats on the diet deficient in vitamin B ten, or 19 per cent, survived the infection, whereas of fifty-one rats given the yeast in addition, thirty-eight, or 75 per cent, survived the infection. The authors conclude that the addition of the vitamin B complex to the diet lacking in this factor increased the resistance of the rats against infection.

Coagulation of Blood of the New-Born.—Sanford and his associates exposed ten new-born infants to ultraviolet radiation by means of an air-cooled mercury vapor quartz lamp of 110 volts, 60 cycles and 10 amperes. A voltage of 70 was always administered and maintained throughout the exposure. The dorsal and ventral surfaces were exposed for two minutes each daily, and the time was increased one minute a day until the length of the exposure was eight minutes. Next, ten new-born infants were given 3 drops of viosterol in oil 250 D on the second day, and the dose was doubled each day until 96 drops was given; this dosage was used for two days. Examination of the blood revealed that either exposure to ultraviolet radiations or the administration of viosterol 250 D, or both tended to increase the fibrinogen of the coagulation substance to a slight extent, and to decrease the antithrombin, thereby increasing the tendency of the blood to clot.

Serum Therapy in Meningococcus Meningitis. — Lyon reports four cases of meningococcus meningitis in which he gave large doses of serum by introducing the serum into the ventricle and simultaneously withdrawing fluid from the spinal subarachnoid space. The cerebrospinal fluid became sterile within from thirty-six to forty-eight hours. These patients, given but two injections of serum, received large doses of serum at each injection; in this respect the desideratum was approached, i. e., a high concentration of serum in the cerebrospinal fluid with a chance for maximum and speedy toxin neutralization, agglutination, bacteriolysis and phagocytosis, and a wide distribution of the serum throughout the cerebrospinal fluid system. A child of 9 months took from 60 to 70 cc. of serum at one administration. A child of 3½ years took from 90 to 100 cc. The major portion of this serum remained within the cerebrospinal fluid system, even if from 10 to 20 cc. more fluid was removed than was introduced. This gives some idea of the amount of serum that may be substituted for cerebrospinal fluid by this method of serum administration or "substitution." The method was not severe on the patients so treated, and unfavorable reactions did not occur. The patients were singularly free from increased depression or other untoward effects, such as one might anticipate from such a form of treatment. Clinical improvement was remarkably speedy and satisfactory. This method is particularly valuable in the case of an infant with a patent anterior fontanel. In such cases it may be employed with ease. In infants the incidence of complications and the mortality rate is usually highest. Because of the decreased number of administrations of serum, and the shorter period of serum therapy made possible by this method, the chances of an Arthus phenomenon occurring would be greatly reduced. This method of substituting serum for cerebrospinal fluid is presented with the realization that such a small series of cases cannot be more than suggestive of possible results. It is a method that may be employed with relative safety to the patient. It makes possible a greater dosage and a wider distribution of serum than may be had with other methods. It should be effective in preventing, as well as removing, complicating obstructions. The method should produce a higher percentage of complete recoveries, and quicker recovery than any method of serum therapy now in use.

Atelectasis in the New-Born. — According to Dunham, atelectasis of the lungs in new-born infants is the abnormal persistence of the fetal state of the lungs due to some condition that interferes with the normal functioning of the respiratory center or to mechanical obstruction of the air passages. The chief symptom of atelectasis is cyanosis. Cyanosis due to atelectasis of the lungs can be differentiated from cyanosis caused by other conditions by means of roentgenograms. The roentgenographic picture of atelectasis of the lungs in the new-born is characterized by haziness of the lung fields, which is evidence of lack of complete aeration, and by the abnormal shape of the thorax and the abnormal position of the ribs, which are evidence of incomplete expansion of the lungs. The author emphasizes the fact that roentgenographic examination of the lungs is always indicated when a new-born infant is cyanotic.

Esophageal Obstruction.—Stokes and Wilder studied the effect of complete closure of the esophagus with the loss of saliva on the life and growth of a child of 10 years. Such closure appears to have no serious effect provided a well balanced diet is supplied. The addition of saliva and other secretions of the mouth to the food is probably unnecessary for the maintenance of a state of nutrition at least approaching normal. Experimentally, the authors produced esophageal fistulas by means of a three stage operation on young pigs. This work furnished evidence that growth will proceed at a rapid rate in this particular animal despite a complete loss of saliva.

Migratory Peritonitis. — Wile and Saphir report that twenty-four cases of peritonitis, twenty-one of which were diagnosed clinically as hematogenous peritonitis, proved at necropsy to be the result of an invasion of the peritoneal cavity by bacteria from primarily diseased intraperitoneal organs or structures close to the peritoneum, without perforation or without direct extension of the inflammatory process to the peritoneum. Sixteen of the twenty-four cases showed enteritis. The term "migratory peritonitis" seems appropriate

for this type of case, because it corresponds with the German term "Durchwanderungs-Peritonitis" and signifies the pathogenesis of this form of peritonitis. The authors believe that clinical reports of cases of hematogenous peritonitis without necropsies, or with necropsies but without complete histologic examination of the gastro-intestinal tract, such as comprise the bulk of the literature of so-called hematogenous peritonitis, should be discarded. Many of the cases in which the condition was reported as hematogenous peritonitis are examples of migratory peritonitis. The evidence supporting the occurrence of peritonitis directly following a blood stream infection without an intermediary lesion within or adjacent to the peritoneal cavity is inadequate. So-called hematogenous peritonitis may occur as part of a generalized metastatic pyemic process that results in abscess formation or infected thrombi within or adjacent to the peritoneal cavity. The ensuing peritonitis is the direct result of the abscess or thrombus. It is unlikely, however, that this form of peritonitis does occur in the absence of other metastatic pyemic phenomena.

Pyuria and Pyelitis.—Stewart produced pyelitis in fourteen of forty-five rabbits by infusions of 20 per cent solution of sucrose. In thirteen of twenty-eight animals that had received four or more injections, pyelitis developed. Repeated injections and longer survival of the animals increased the incidence of urinary infections. The situation of the inflammation in the lining of the pelvis and the absence of cortical abscesses are strong evidence that the lesions were due to ascending infection. There is no evidence to show whether this occurred by way of the lumen of the ureter or the accompanying lymphatic channels. Some possible explanations of these observations are considered. A logical conclusion is that the injection of sucrose lowered the resistance of the kidneys to infection. That this can result from a decreased water content of the body was shown in mice by Schiff. The mechanism by which this lowered resistance is brought about is not known. The effect of decreased intake of water was studied in rats, guinea-pigs and dogs. In spite of rigorous restriction of fluids, pyuria was observed only once, in a guinea-pig without bacilluria. There was no histologic evidence of inflammation of the urinary tract in any of the animals. From these observations it seems improbable that withdrawal of water from the tissues alone was responsible for the pyelitis produced in rabbits. The symptoms of toxicosis as described by Kramár appeared only in the two dogs, but in these animals pyuria did not develop. Definite conclusions cannot be drawn from so few experiments. It has been established, however, that a similar picture does not result in rats or guinea-pigs. Pyuria occurred only once in these animals, and thus it seems improbable that it was related to the exsiccosis.

American Journal of Ophthalmology, St. Louis

15: 293-396 (April) 1932

*Experimental Granular Conjunctivitis in Monkeys Induced by Bacterium Granulosis. P. Thygeson, Denver.—p. 293.
Albinism in Progeny of Negro and White Parents. C. M. Swab, Omaha.—p. 306.
Diffuse Papilloma of Limbus. M. F. Weymann, Los Angeles.—p. 310.
Brown Duochrome Refraction Test: Description and Comparison. M. Jacobs, Chicago.—p. 313.
Technic of Prolonged Occlusion Test. F. W. Marlow, Syracuse, N. Y. —p. 320.
*Tonometry Before and After Cataract Operation. H. Ferrer, Havana, Cuba.—p. 324.
Pulsating Exophthalmos. A. Kolodny, Sioux City, Iowa.—p. 327.
Analogies and Differences of Second and Eighth Nerves and End-Organs: Generalizing Preliminary Considerations: II. Anatomic. C. B. Walker, Los Angeles.—p. 329.

Granular Conjunctivitis in Monkeys.—Four of five monkeys in which folliculosis was produced by Thygeson yielded Bacterium granulosis. The disease differs from human trachoma mainly in the absence of pannus. The author concludes that etiologic relationship of this organism to human trachoma can never be established by monkey experimentation.

Tonometry Before and After Cataract Operation.—Ferrer advises the routine use of the tonometer in the examination of eyes preliminary to cataract extraction. In the majority the tension will be found normal and choice of operative procedure is unrestricted. In those with subnormal tension it is advisable to dilate the pupil widely with atropine to promote ease of delivery of the lens, which is liable to be luxated by pressure. In eyes showing notably increased tonus, atropine is a source of danger. The tension should be lowered by suitable measures before extraction of the lens. Tonometric measurement may be made by the twelfth postoperative day if anything abnormal is noticed. The use of atropine is objectionable before or after discission. It is never necessary and frequently dangerous, as hypertension is apt to follow this operation as the result of imbibition of aqueous into the vitreous.

American Journal of Physical Therapy, Chicago

8: 317-344 (March) 1932

Flatfoot and Its Relation to Triceps Surae Muscle. A. Gottlieb, Los Angeles.—p. 321.
Arthritis. N. J. Seybold, Toledo, Ohio.—p. 324.
What is Sciatica? W. Martin, Atlantic City, N. J.—p. 326.
Meditations of a Medicine Man. I. S. Trostler, Chicago.—p. 332.
We: Electric Expeditionary Forces. B. B. Grover, Colorado Springs, Colo.—p. 337.

Arch. of Physical Therapy, X-Ray, Radium, Chicago

13: 133-189 (March) 1932

Postparalytic Treatment of Poliomyelitis from Orthopedic Standpoint. W. I. Galland, New York.—p. 133.
*Roentgen Therapy in Infantile Paralysis: Review of Technic and Results of Treatment. L. T. Le Wald, New York.—p. 138.
General Problem of Poliomyelitis. Shirley W. Wynne, New York.—p. 140.
*Scope of Electrosurgery in General Surgery. W. E. Ground, Superior, Wis.—p. 148.
Electrosurgery in Rhinolaryngology: A Solution for Tonsil, Turbinate and Sinus Problems. L. J. Silvers, New York.—p. 154.
Ultraviolet and Infra-Red Glasses. S. English.—p. 164.

Roentgen Therapy in Anterior Poliomyelitis.—Le Wald calls attention to the fact that opinions regarding the specific value of roentgen therapy in anterior poliomyelitis are divided even among foreign workers. It should be noted, however, that nowhere among those using the method has there been voiced any distinct opinion against its use or its harmfulness. On the basis of what has already been accomplished, radiation therapy promises definite amelioration and improvement of certain symptoms and hence may well be considered as a potent therapeutic adjuvant in the management of anterior poliomyelitis.

Scope of Electrosurgery in General Surgery.—According to Ground, electricity has a wide field of usefulness in gynecology, and few there are who can practice this specialty successfully without its use in some form. Electrocoagulation is being utilized by many gynecologists, but there is no reason why the general practitioner who is, so to speak, electrically and gynecologically inclined, cannot use this very beneficient agency with equal readiness.

Arkansas Medical Society Journal, Little Rock

28: 185-208 (March) 1932

Irritable Spastic Colon; Common Condition Frequently Mismanaged. G. W. Parson, Texarkana.—p. 185.
Electrocardiography as an Aid in Diagnosis and Prognosis of Cardiac Irregularities. R. F. Baskett, Texarkana.—p. 189.

Bulletin of Neurol. Inst. of New York, Baltimore

2: 1-156 (March) 1932

*Reflexes and Other Motor Activities in New-Born Infants: Report of One Hundred and Twenty-Five Cases as Preliminary Study of Infant Behavior. L. B. Chaney and Myrtle B. McGraw, New York.—p. 1.
*Familial Periodic Paralysis. E. G. Zabriskie and A. M. Frantz, New York.—p. 57.
*Improved Method of Encephalography. L. M. Davidoff and C. G. Dyke, New York.—p. 75.
*Meningeal Fibroblastomas on Under Surface of Temporal Lobe, and Their Surgical Treatment. C. A. Elsberg, New York.—p. 95.
Studies of Pathogenesis of Multiple Sclerosis: III. Further Evidence of Abnormal Lipolytic Activity in Blood in Multiple Sclerosis. R. M. Brickner, New York.—p. 119.
Note on Sympathetic Nerve Supply of Eye in Cat. E. M. Deery, New York.—p. 134.
Tumors in Posterior Cranial Fossa with Mental Symptoms: Three Cases. R. W. Southerland, New York.—p. 144.

Motor Activities in New-Born Infants.—Investigation of the reflex reactions in infants during the first ten days of life lead Chaney and McGraw to the following conclusions: Individual differences are evident in the simplest type of reflex reaction in new-born infants; the more complex the type of reaction, the more marked is the individual variation. Although

there is great variability in type of reaction among new-born infants, the total absence of any active reflex response is strongly suggestive of a pathologic condition. For example, an infant's response to plantar stimulation may be dorsiflexion of the toes, plantar flexion of the toes, or some other reaction pattern, but the absence of any reaction whatever is so unusual that it calls for a search for evidence indicating some abnormality or something pathologic. There is nothing in the investigation to substantiate the contention that certain reflex patterns, such as the Babinski (considered of pathologic significance when present in adults), is in infants a normal reflex reaction attributed to an immature nervous system. Reflex reactions of normal new-born infants are different from the characteristic reflexes of normal adults; but they are different also from the classic pathologic reflex patterns.

Familial Periodic Paralysis.—Zabriskie and Frantz report the case of a man, aged 23, with a rather severe form of familial periodic paralysis. His mother suffered from the same disease and in all probability died from it. Examination during an attack showed a decrease or abolition of the deep reflexes, a slowing of muscular decontraction after reflex or electrical stimulation, a diminution or loss of the electrical excitability of the muscles, and at times an enlargement of the heart to the left with an apical systolic murmur. All these observations have been noted repeatedly by other clinicians. The chemical constituents of the blood were within normal limits during the free intervals and during the attacks; in particular, alterations in the calcium content were not found. A somewhat increased tolerance for dextrose was noted. Microscopic examination of specimens of muscle removed at biopsy showed a vacuolization of some fibers and in places a granular substance in these vacuoles. Partial attacks were repeatedly induced by local cooling, in confirmation of the work of Neel. During the induction of such attacks and during the artificially accelerated recovery (by local heat) the steady decrease of electrical excitability could be followed to its extinction, and then the rise of this excitability was again watched. What the authors believe to be a new contribution is the demonstration of an extraordinary fluctuation in the creatinine output with the patient under standard conditions. This is probably the expression of a fundamental disorder of muscular metabolism. The variable, but generally high, fluid intake and output is also in keeping with previously published observations. The striking differences noted in oxygen consumption between excised portions of paralyzed and nonparalyzed muscles is also a new observation. It must be emphasized, however, that this is an isolated observation and proper weight can be given to it only after further similar experimental studies have been made. Finally, chemical analysis of the muscles showed a low total inorganic phosphate, low creatinine and very low organic acid soluble phosphorus.

Improved Method of Encephalography.—Davidoff and Dyke emphasize that it is possible to obtain good encephalograms with much less air than is usually introduced, and thereby to decrease materially the discomfort of the patient both during and after the procedure. The severity and duration of the symptoms occurring during and after lumbar air injection seem to depend on the amount of air used, not, however, in absolute terms, but relative to the size of the ventricles. The authors have learned to determine the amount of air necessary in any given case by taking a film after 20 cc. of air has been introduced, and immediately developing it. Inspection of this film shows whether the ventricular system is normal in size or whether it is dilated. If the size of the ventricles is within normal limits, from 50 to 70 cc. of air is sufficient for excellent encephalograms. Furthermore, they are convinced that stereoscopic roentgenograms from four sides with the head both vertical and horizontal are necessary for the proper interpretation of the encephalograms. They have followed this procedure for two years in more than 300 cases and have been able to demonstrate that the practice of taking the films in only the vertical or horizontal position may lead to erroneous interpretations. This relatively large number of exposures entails no danger to the patient.

Meningeal Fibroblastomas.—Elsberg believes that for the approach to a tumor underneath the temporal lobe, whether the growth is derived from the dura of the floor of the middle cranial fossa or from that of the sphenoid ridge, the base of the bone flap must be as low in the temporal region as possible, and bone should be rongeured away below the bone flap until the base of the skull has been reached. If the neoplasm is attached to the sphenoid ridge and is to be approached by elevation of the frontal lobe, the flap that is outlined should extend forward almost to the frontal sinus; while if the tumor lies farther back, the scalp incision may be made entirely within the hairline. After the bone flap has been turned down and the bone has been rongeured away down to the base of the skull, an incision should be made in the dura low in the temporal region. If the neoplasm is exposed or its position located, the dura incision should be enlarged forward and backward, and a dural flap formed with its base upward. This dural flap should be large, so that there will be room for the elevation of the temporal lobe without undue pressure on this and adjacent parts of the brain. In order to expose the growth fully, a small secondary flap must often be made by incisions in the dura downward toward the base of the skull. When the layer of cortex that lies over the growth is thin, it is usually advisable to excise it or to make an incision through the brain tissue down to the surface of the neoplasm. On the other hand, if a considerable part of the temporal lobe covers the growth, the attempt must be made to elevate the lobe by slowly wiping it away at the same time that the brain is raised with a retractor. As soon as one is certain that the neoplasm is attached to the dura on the floor of the middle fossa and especially if intracranial pressure is not much increased, the attempt should be made to separate the dura from the bone underneath the temporal lobe, in a similar way to that done in operations for trigeminal neuralgia. By this procedure it may be possible to expose and plug the foramen spinosum with waxed cotton, and by this means to occlude the middle meningeal artery. This vessel or its branches supply a great deal of blood to growths in this situation, and the advantage gained by occluding it is evident. If, however, the bleeding is excessive while the dura is being separated from the bone, or if the pressure is so great that the dura cannot be elevated without undue force, the procedure cannot be carried out. It is seldom, if ever, advisable to attempt to deliver the tumor in toto unless the growth is soft in consistency and every part of the tumor bed can first be brought into view by drawing the growth in one or another direction. In the large hard growths it is always better to remove the central part with the electric knife before attempting to separate the brain from the tumor capsule. The gradual raising of a firm growth out of its bed can sometimes be successfully accomplished, but there is always the danger that vessels in the deeper part of the tumor bed will be torn and a troublesome if not serious bleeding will occur. The larger the author's experience with these growths has become, the more often has he attempted to excise the attached part of the dura by separating it from the bone. No operation for a meningeal growth is ever ideally complete unless the dural attachment is removed together with the growth. Cauterization of the inner surface of the membrane with the electric current or with Zenker's solution is often the best that can be done; it is frequently an efficacious though not an ideal procedure. When there is a marked hyperostosis on the floor of the middle fossa, it is seldom possible to do a radical operation and a late recurrence of symptoms may be expected.

Johns Hopkins Hospital Bulletin, Baltimore

50: 237-304 (April) 1932

Centers of Vegetative Nervous System. E. A. Spiegel, Philadelphia.—p. 237.
Experimental Yaws: I. Comparison of Availability of Rabbit and Monkey for Isolation of Strains of Yaws. T. B. Turner, Baltimore, and J. H. Chambers, Port au Prince, Haiti.—p. 253.
*Serologic Reactions with Hemolytic Streptococci in Acute Bacterial Infections. W. S. Tillett and T. J. Abernethy, Baltimore.—p. 270.
Direct Measurements of Oxygen Consumption of Isolated, Beating Auricles from Normal and Thyrotoxic Guinea-Pigs. D. McEachern, Baltimore.—p. 287.

Serologic Reactions with Hemolytic Streptococci in Acute Bacterial Infections.—Tillett and Abernethy present observations which demonstrate that serums from patients acutely ill with a variety of bacterial infections are capable of agglutinating certain strains of hemolytic streptococci. During the course of an acute illness, the capacity of a patient's serum

to react is demonstrable early after onset, persists during the active stage, and disappears soon after recovery. Four strains of Streptococcus hemolyticus, derived from different diseases, are agglutinable. Agglutinability is destroyed by heating cultures to the thermal death point. Agglutinable cultures killed with solution of formaldehyde are not altered. The protein fraction of serum precipitated by carbon dioxide under conditions described contains the constituent reactive with streptococci. By this method, serums from cases of typhoid were fractionated and the agglutinins for typhoid bacilli and hemolytic streptococci were separated.

Journal of Infectious Diseases, Chicago

50: 185-280 (March) 1932

*Derivation of Staphylococcus Albus, Citreus and Roseus from Staphylococcus Aureus. M. Pinner, Tucson, Ariz., and Marie Voldrich, Northville, Mich.—p. 185.
*Bacteriology of Bronchiectasis: Analysis Based on Nine Cases in Which Lobectomy Was Done. P. H. Greey, Toronto, Canada.—p. 203.
Study of Intestinal Flora of Chicks Affected with Pullorum Disease. M. W. Emmel, Auburn, Ala.—p. 213.
*Nature and Properties of Virus of Herpes. Margaret Holden, New York.—p. 218.
*Progressive, Selective Absorption of Precipitins in Multivalent Serum. L. Hektoen and Edna Delves, Chicago.—p. 237.
Flocculation Tests for Differential Diagnosis of Smallpox and Chickenpox. L. C. Havens and Catherine R. Mayfield, Montgomery, Ala.—p. 242.
Effect of Urine on Hemolytic Streptococci. G. H. Robinson and F. A. Taylor, Pittsburgh.—p. 248.
Toxicity of Iodine for Cells of Mycobacterium Tuberculosis. G. Knaysi, Ithaca, N. Y.—p. 255.
Use of Iodine and Certain Iodine Compounds in Experimental Tuberculosis. G. Knaysi, Ithaca, N. Y.—p. 261.
*Influence of Blood and Exudate on Action of Bacteriophage Against Colon Bacillus. Martha Applebaum and W. J. MacNeal, New York.—p. 269.
Purification of Virus Vaccinia. C. A. Behrens and L. B. Morgan, Lafayette, Ind.—p. 277.

Staphylococcus Aureus.—According to Pinner and Voldrich, apathogenic Staphylococcus albus, Staphylococcus citreus ad Staphylococcus roseus are split off spontaneously from pure line strains of Staphylococcus aureus. The splitting off of Staphylococcus albus can be much enhanced by growing Staphylococcus aureus in broth containing aureus agglutinins and by animal passage. The three nonidentical strains derived from Staphylococcus aureus appear to be stable under ordinary conditions. They differ from the mother strains in regard to pigment production, growth intensity, individual morphology, staining reactions, virulence, fermentative and proteolytic action, hemolysin production, alkali production, agglutinability, immunizing properties and susceptibility to bacteriophage. From albus strains aureus strains can be recovered by cultivating the albus strains for prolonged periods in mediums containing high concentrations of antialbus serum. The relation between aureus and albus strains is essentially similar to that between S and R strains of other micro-organisms.

Bacteriology of Bronchiectasis.—Greey did not find a uniform bacterial flora in nine cases of bronchiectasis. Bacteria of various types were obtained in each of the cases studied. The absence of spirochetes in five of the cases suggests that their presence in the other four was a chance invasion. This also holds true for the other micro-organisms isolated. Pure cultures of a single type of streptococcus were obtained from the bronchi following lobectomy on three occasions, which indicates that a mixed infection is not necessarily present. The variety of micro-organisms recovered suggests that no specific type is an etiologic factor but that many bacteria are capable of producing bronchial damage sufficient to favor dilatation.

Nature and Properties of Virus of Herpes.—Holden states that the enhanced resistance of desiccated herpes virus to deterioration, heat and the action of certain chemicals is striking when compared with the resistance of moist herpes virus to the same factors. A comparison of the resistance of pneumococci, both moist and dried, to chemical agents and heat, with the resistance of herpes virus under similar conditions, furnishes results that are not inconsistent with the assumption of the living nature of the virus.

Absorption of Precipitins.—Hektoen and Delves describe experiments in which they demonstrated that precipitins in multivalent serum may be removed successively with reasonable success by the selective action of single antigens. The successive absorptions were carried out by treating the same sample of antiserum with several antigens, one after another. After each treatment or absorption, the precipitate was removed by centrifugation and the serum tested with the antigens involved in the experiment.

Action of Bacteriophage Against Colon Bacillus.—Applebaum and MacNeal report that purulent exudate, even when diluted, exerts an interfering influence on the lytic action of bacteriophage against the colon bacillus, provided the colon bacillus is capable of active growth in the medium employed. Human blood serum and rabbit blood serum exert a similar but less powerful interfering influence, which becomes evident when pathogenic strains of the colon bacillus recently obtained from human infections are employed. Whole blood produces an effect similar to that of serum. Suspensions of erythrocytes in an indifferent medium seem to exert little, if any, influence on the bacteriophage phenomenon in relation to the colon bacillus. These observations have a bearing on the use of bacteriophage in the treatment of infectious disease.

New England Journal of Medicine, Boston

206: 659-716 (March 31) 1932

*Clinical Significance of Precordial Tenderness: Relationship to Pain. F. Kellogg, San Francisco, and P. D. White, Boston.—p. 659.
*Electrosurgical Method for Aseptic Anastomosis of Intestine. J. E. Briggs and L. R. Whitaker, Boston.—p. 662.
Industrial Dermatoses and Their Treatment: Review of Ten Years' Literature. J. G. Downing and C. E. Welch, Boston.—p. 666.
Notes on Alexander Ramsay and His Anatomic Manuscripts. J. F. Ballard, Boston.—p. 681.
Progress in Pediatrics. J. L. Morse, Boston.—p. 683.

Significance of Precordial Tenderness.—Kellogg and White call attention to the fact that precordial tenderness may occur in an individual with a hypersensitive nervous system, whether or not there is serious heart disease. In a series of 328 cases of definite precordial tenderness that they observed, the condition was more often found when there was a combination of heart disease and nervousness than with either condition alone. The factor of nervous irritability and fatigue is certainly of greater importance in the production of the sign than is organic cardiovascular disease itself, for in cases of very severe acute and fatal coronary thrombosis there may be no tenderness whatever, and in many nervous individuals with perfectly normal hearts there is well marked precordial tenderness.

Aseptic Anastomosis of Intestine.—Briggs and Whitaker describe a new method for aseptic anastomosis of the intestine by electrosurgery. It consists essentially in devitalization by fulguration of an area the size of the proposed stoma on either end or side of the intestine to be joined, followed by careful approximation and fixation with a double row of mattress sutures. The advantages are ease of execution, reduction of trauma and danger of contamination to a minimum, and accurate coaptation of the joined edges without excessive infolding. The only disadvantage is blockage of the intestine for from twelve to twenty-four hours until the devitalized "button" sloughs out. Since, however, in obstructive cases enterostomy or colostomy should always be performed, there is no real objection on this ground. Experimental results have been excellent.

New York State Journal of Medicine, New York

32: 375-436 (April 1) 1932

Judgment in Gynecologic Problems. G. B. Broad, Syracuse.—p. 375.
Volkmann's Contracture of Leg. E. K. Cravener, Schenectady.—p. 381.
Oral Surgery of Interest to Medical and Dental Practitioner. T. Blum, New York.—p. 383.
Responsibility of Practitioner in Menopausal Bleeding. J. E. King, Buffalo.—p. 385.
Propeptan Therapy of Luithlen-Urbach in Treatment of Allergic Skin Diseases Caused by Food. J. M. Markin, Rochester.—p. 390.
Recent Age Trends in Poliomyelitis. Mildred Weeks Wells, New York.—p. 393.
Renal Anomalies. J. R. Lisa and J. Levine, New York.—p. 395.

Public Health Reports, Washington, D. C.

47: 711-763 (March 25) 1932

*Relation of Oxidation to Proteolysis in Malignant Tumors. C. Voegtlin and Mary E. Maver.—p. 711.

47: 765-835 (April 1) 1932

Rat Infestation Inspection of Vessels. C. L. Williams.—p. 765.

Relation of Oxidation to Proteolysis in Malignant Tumors.—Voegtlin and Maver believe that for the proper

understanding of the proteolytic mechanism of the tissues in living animals it is essential to perform experiments in vitro under conditions approximating those in vivo. They made an attempt in this direction in the case of malignant tissues by reducing the oxygen tension and adjusting the hydrogen ion concentration accordingly. The in vitro autolysis of two malignant tumors showed that both p_H and oxygen tension are controlling factors in tissue proteolysis. These factors apparently operate through their influence on the sulphydryl system of the tissues. The authors present evidence which indicates that not only glutathione but also proteins containing SH groups are concerned in tissue proteolysis. Confirmatory evidence is obtained from experiments dealing with (1) the digestive action of papain on coagulated egg white containing protein SH groups, and (2) the action of papain on gelatin and fibrin in the presence of reduced glutathione. The results afford substantial proof for the coupling of oxidation-reduction and proteolysis in tissues.

Radiology, St. Paul

18: 471-712 (March) 1932

Important Anatomic Data of Digestive Tract. The Cole Collaborators, New York.—p. 471.
Capacity of Roentgen-Ray Tubes as Influenced by Geometric Design of Focal Spot, Including Advantages and Limitations of Line Focus Principle. P. M. Andrus and A. Hambleton, London, Ont., Canada. —p. 521.
Functional Interrelationships of Thyroid Gland and Autonomic Nervous System. A. Kuntz, St. Louis.—p. 532.
Surgical Aspect of Thyrotoxicosis. W. Bartlett and W. Bartlett, Jr., St. Louis.—p. 536.
*Surgical Treatment of Thyrotoxicosis. H. M. Richter, Chicago.—p. 542.
Medical Aspect of Thyrotoxicosis. C. Elliott, Chicago.—p. 549.
*Roentgen-Ray Treatment in Goiter Illness: Results Reported and Comments Made on Two Hundred Individually Controlled Cases. A. H. Williams, Grand Rapids, Mich.—p. 553.
Radiologic Aspect of Thyrotoxicosis. L. J. Menville, New Orleans. —p. 568.
Radium Treatment of Toxic Types of Goiter. D. T. Quigley, Omaha. —p. 576.
Prevention of Hyperplasia of Thyroid in Opossum by Roentgen Rays. O. M. Walter, B. J. Anson and A. C. Ivy, Chicago.—p. 583.
Skeletal Disturbances and Anomalies: Clinical Report and Review of Literature. I. Cohn, New Orleans.—p. 592.
Note on International Comparison of Roentgen-Ray Standards. L. S. Taylor, Washington, D. C.—p. 627.
How We May Reduce Number of Malpractice Suits. I. S. Trostler, Chicago.—p. 628.

Surgical Treatment of Thyrotoxicosis.—Richter performed radical thyroidectomy on 1,235 patients suffering from thyrotoxicosis. But few of these patients were not completely relieved of their symptoms by the operation. Reoperation was done on twenty-three, and, of these, twenty-one were relieved as shown by clinical symptoms and metabolism tests. One patient required a third operation to secure this result. Three patients made normal recoveries and had two or more normal postoperative metabolism tests, to be followed by recurrence of thyrotoxicosis. These cases can be properly designated as "relapses." One of these was shown to be due to inadequate removal of thyroid tissue. On the basis of his observations the author concludes that, in the hands of competent surgeons, radical thyroidectomy seems to be the most satisfactory treatment for thyrotoxicosis. The evidence presented showing the value of radiologic treatment is faulty because of failure to present adequate preoperative and postoperative studies of the patients treated. The immediate mortality with the radiologic treatment, while low, is misleading in view of the shortening of life expectancy with the incomplete relief from the thyrotoxicosis that may occur in many of the cases.

Roentgen Treatment in Goiter Illness.—Williams reports the results he obtained in 200 cases of goiter by means of roentgen irradiation. The patients averaged ten treatments over a period of three and one-half months. The average drop in pulse was 24.2 beats; average gain in weight, 8 pounds (17.6 Kg.), and lowering in metabolic rate, 23 points. One hundred and sixty-one patients, or 80.5 per cent, were definitely cured. Twenty-seven, or 13.5 per cent, were improved, making a total of 188, or 94 per cent, either cured or improved. Eight, or 4 per cent, recurred after one year, five of which were later retreated and cured. Only two patients, or 1 per cent, developed subthyroid symptoms, and only one case, or 0.5 per cent, showed telangiectases. The author emphasizes the importance of unhurried diagnosis and frequent metabolic rate check.

Tennessee State Medical Assn. Journal, Nashville

25: 85-126 (March) 1932

Aschheim-Zondek Test: Its Value in Tubal Pregnancy by Case Report. J. R. Reinberger, Memphis.—p. 85.
Acute Otitis Media with Pain in Trigeminal Region. R. G. Reaves, Knoxville.—p. 88.
*Syphilis of Eighth Nerve and Its Branches. W. A. Garrott, Chattanooga. —p. 95.
Some Behaviorism Considerations of Childhood. W. E. van Order, Chattanooga.—p. 101.
Proposed Amendments to World War Veterans' Act, Together with Parts of Act Affected by Amendment. H. H. Shoulders, Nashville. —p. 108.

Syphilis of Eighth Nerve.—According to Garrott, syphilis of the eighth nerve occurs in two chief forms, neurolabyrinthitis syphilitica, or early auditory syphilis, and labyrinthitis syphilitica tarda, or late auditory syphilis. Neurolabyrinthitis syphilitica responds favorably to treatment in the majority of cases; labyrinthitis syphilitica tarda does not always respond as favorably in as many cases, but many of the cases are checked or stopped in their progress. The author believes that syphilis of the eighth nerve or its branches is more common than the diagnostic records of most otologists would indicate. If diminished bone conduction is just ground for suspicion of syphilis of the eighth nerve and its branches, and if it is an early manifestation of nervous system syphilis, otologists should be more alert and watch for it more carefully. Though one may not relieve all the auditory symptoms, one is obliged to recognize the systemic nature of the infection and cooperate with competent serologists in the treatment of it. By the same token, the serologist and the general practitioner should remember the possibility of eighth nerve involvement and consult the otologist. And he should attempt to outline his treatment according to the degree of involvement as determined by the otologist.

Texas State Journal of Medicine, Fort Worth

27: 767-836 (March) 1932

Interesting Blood Dyscrasia: Report of Case. T. L. Denson and J. E. Robinson, Temple.—p. 773.
Benign Stricture of Rectum. C. Rosser, Dallas.—p. 777.
Fractures of Distal End of Radius. G. W. N. Eggers, Galveston.—p. 780.
Intussusception Due to Benign Tumors of Small Intestine. O. Roan, San Antonio.—p. 782.
Agranulocytosis: Report of Case. C. A. Poindexter, Crystal City, and B. F. Stout, San Antonio.—p. 787.
Polymorphonuclear Leukopenia. J. S. Sweeney, Dallas.—p. 790.
Comparison of End-Results in More Common Types of Uterine Suspension. H. O. Smith, Marlin.—p. 795.
Emotional and Psychic Factors in Production of Gastro-Intestinal Disease. G. M. Underwood, Dallas.—p. 798.
Cathartic Colitis. D. C. McBride, Dallas.—p. 801.
Mechanics of Constipation and Its Treatment. W. S. Horn, Fort Worth. —p. 803.
Breast Feeding. J. F. Perkins, Dallas.—p. 808.
Larynx in Tuberculous. S. A. Schuster and F. P. Schuster, El Paso. —p. 812.

West Virginia Medical Journal, Charleston

28: 145-192 (April) 1932

Nervous Patient and General Practitioner. W. H. Mayer, Pittsburgh. —p. 145.
*Cutaneous Manifestations of Syphilis. J. C. Matthews, Huntington. —p. 149.
Management and Obstetric Care. J. P. Lilly, Charleston.—p. 155.
Headache and Its Significance. A. P. Hudgins, Hinton.—p. 158.
Malnutrition During Early Childhood. J. L. Blanton, Fairmont.—p. 163.
Pleuro-Enteritis. C. M. Bray, Morgantown.—p. 167.

Cutaneous Manifestations of Syphilis.—Matthews enumerates the characteristics of late syphilis of the skin as follows: (1) solitary, or at most few lesions; (2) asymmetry, though by no means invariable; (3) induration, deep palpable infiltration; (4) indolence; a relatively low grade inflammatory process; (5) arciform configuration, the borders being polycyclic or forming segments of circles, both in the individual lesions and in the group of lesions; (6) sharp margination, punched out appearance in ulcers; (7) tissue destruction and replacement without ulceration; (8) tendency to central or one-sided healing with peripheral extension; (9) scar formation: superficial, atrophic and noncontractile scar retaining the arciform shape of the original lesion, and (10) peripheral hyperpigmentation of rather persistent character. No one of these ten individual items can be accepted alone, but the combination often becomes an element of great value and should be carefully considered in interpreting the Wassermann reaction.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

1: 507-550 (March 19) 1932

*Influence of Cereal-Free Diet Rich in Vitamin D and Calcium on Dental Caries in Children. May Mellanby and C. L. Pattison.—p. 507.
*Malignant Disease of Hypopharynx and Its Treatment by Excision. W. Trotter.—p. 510.
*Management of Urinary Calculi. A. Jacobs.—p. 513.
Conditioned Reflexes and Habit Formation. W. H. Gantt.—p. 517.
Thoracic Metastases in Ovarian Carcinoma: Report of Case with Remarks. H. T. Evans and G. I. Strachan.—p. 519.

Cereal-Free Diet and Dental Caries.—Mellanby and Pattison gave a group of children averaging 5½ years of age a cereal-free diet rich in vitamin D and calcium for a period of six months. The teeth of the children were defective in structure (hypoplastic), and much active dental caries was present at the beginning of the investigation. Initiation and spread of caries were almost eliminated by these diets, and the results were better than those of a previous investigation in which the vitamin D alone was increased in a diet containing bread and other cereals. Active caries was arrested on this cereal-free diet to a greater extent than in the previous investigations, when cereals were extensively used. The practicability of giving a cereal-free diet to children has, of course, to be considered. No difficulty was encountered in the elimination of cereals from the food, although the children did not like giving up bread. These children were in an institution and were confined to bed, but it would obviously be more difficult to give the diet to active children, especially if living at home. The tests do not indicate that in order to prevent dental caries children must live on a cereal-free diet, but in association with the results of the other investigations on animals and children they do indicate that the amount of cereal eaten should be reduced, particularly during infancy and in the earlier years of life, and should be replaced by an increased consumption of milk, eggs, butter, potatoes, and other vegetables. They also indicate that a sufficiency of vitamin D and calcium should be given from birth, and before birth, by supplying a suitable diet to the pregnant mother. The teeth of the children would be well formed and more resistant to dental caries instead of being hypoplastic and badly calcified.

Malignant Disease of Hypopharynx.—Trotter believes that the final results of operative treatment in malignant disease of the hypopharynx must be considered from two points of view: first, freedom from recurrence, and, second, the condition in which the patient survives. He emphasizes the value of precise local knowledge of the epitheliomas of the pharynx in dealing with them by operation. Such knowledge makes possible the exact orientation of any necessary operation, and so increases the prospect of cure and at the same time diminishes the need for mutilation. The view is sometimes expressed that the more extensive an excision the more likely is it to be successful; this is by no means necessarily true, for if the operation is not exactly oriented in regard to the growth its mere extent is unlikely to save it from failure. This criticism applies to many cases in which extirpation of the larynx is practiced in dealing with pharyngeal growths. There are only a few cases in which that formidable mutilation is of use in the treatment of such growths. Most of the cases in which the tumor cannot be removed without laryngectomy are incurable by any operation, and when the tumor can be removed by local excision the mere addition of laryngectomy gives no further security. In a small number of illustrative cases mentioned, the only residual disabilities left have been the occasional fixation of one vocal cord, and in one case some fibrous constriction of the esophagus. The author would not feel able to record as a true success the cure of a pharyngeal carcinoma won at the expense of laryngectomy. He considers that one of the most beneficent effects of the introduction of radiotherapy has been its tendency to make one look with increasingly critical eyes at treatment by crudely mutilating operations.

Management of Urinary Calculi.—Jacobs states that, except in some special circumstances, stones in the kidney should be removed. If that is not done destruction of the organ will generally result, bringing in its train chronic ill health and possibly death from renal failure. It should also be remembered that the irritation produced by a calculus of long standing may predispose to squamous carcinoma of the renal pelvis. The author has had two patients who confirm this hypothesis. In both, the kidney was removed because of extensive destruction resulting from multiple calculi, and histologic examination revealed the presence of a squamous carcinoma which had not been suspected prior to operation. One patient was a man of 54, whose history suggested that calculus formation had started eighteen years previously. The other patient was a man of 69, who dated back the onset of his symptoms to boyhood. If a minute renal calculus is not causing the patient much pain an expectant attitude may be adopted, particularly when the pyelogram shows that no damage is being caused to the kidney. The patient should take abundant bland fluids and be kept on urinary antiseptics. Periodic lavage of the renal pelvis through a ureteral catheter, followed by an instillation of silver nitrate, may help to mobilize the stone and keep the kidney free from infection.

Lancet, London

1: 601-652 (March 19) 1932

*Pathology and Treatment of Anemia. L. J. Witts.—p. 601.
*Disseminated Sclerosis: Clinical and Serologic Observations During Experimental Vaccine Treatment. J. Purves-Stewart and F. D. M. Hocking.—p. 605.
*Complement Fixation in Rift Valley Fever. J. C. Broom and G. M. Findlay.—p. 609.
Rift Valley Fever. R. Daubney and J. R. Hudson.—p. 611.

Treatment of Anemia.—Witts states that, in the treatment of acute hemolytic anemia, iron, arsenic and removal of septic foci do no good. Liver has been introduced too recently for its value to be assessed, and it has been used only in cases in which the patients might well have recovered by their own forces. The most striking feature of the treatment of acute hemolytic anemia is the dramatic effect of transfusion, often observed in patients who seemed moribund. The temperature falls and a rapid recovery sets in. More than one transfusion may be necessary to arrest the hemolytic process, but in cases properly treated by transfusion, death is a rare event.

Multiple Sclerosis.—Purves-Stewart and Hocking report that in 22 early cases of multiple sclerosis in which treatment by autogenous vaccine was used all the patients except 2 showed arrest or clinical improvement. In 62 moderate cases one fifth continued to deteriorate, while the remaining four fifths either ceased to progress or improved. In 17 advanced cases, 5 continued to progress while 12 remained unchanged. Of 22 early cases, all of which yielded positive cultures of spherules in the cerebrospinal fluid, 3 became culturally negative after treatment by an autogenous vaccine and 6 became less marked, while 15 remained unchanged. Of 62 moderate cases, 4 became culturally negative, 17 became less marked and 34 remained unchanged, while the remaining 7 became more strongly marked. Of 17 advanced cases, 3 became culturally negative, 3 became less marked and 10 remained unchanged, while 1 became more marked. The presence of a characteristic colloidal gold curve was confirmed. In 8 of 101 cases, this curve became negative. Definite improvement was seen in 35 cases; 11 cases became more marked, while 47 remained unchanged. The globulin reaction was positive in 72 cases at the outset; in 24 of these the reaction became negative or very faintly positive. The albumin content in all cases was within normal limits.

Complement Fixation in Rift Valley Fever.—According to Broom and Findlay, Rift Valley fever, the etiology of which was first determined by Daubney, Hudson and Garnham in 1931, is a virus disease of no little importance to sheep and cattle farmers in British East Africa, where it causes a high mortality in young lambs and pregnant ewes. The fact that the disease is transmissible to man and that in certain respects the clinical symptoms resemble those of dengue, sandfly fever and yellow fever, renders accurate diagnosis essential. Specific complement fixation occurs with the serums of men, monkeys, sheep, rats and mice recovered from Rift Valley fever when an antigen of the livers of rats and mice infected with Rift Valley fever is employed. Complement-fixing antibodies are well developed in the serum fourteen days after infection, and they persist for at least six months. Complement-fixing antibodies may appear in the serum in the absence of any definite illness as a result of repeated exposures to infection. The degree of complement fixation is in the case of men, sheep and monkeys

roughly proportional to the severity of the clinical symptoms. Mice and rats produce only small quantities of both complement-fixing antibodies and protective antibodies. Dried liver as an antigen gives less satisfactory results than fresh livers of infected animals.

Medical Journal of Australia, Sydney

1: 315-346 (March 5) 1932

*Tuberculosis in Childhood: Incidence of Bovine Infection in Victoria. R. Webster.—p. 315.
Puerperal Hemorrhage. P. L. Hipsley.—p. 320.
Some Operations on Frontal Sinus. E. P. Blashki.—p. 323.
Palliation and Roentgen Radiation. A. T. Nisbet.—p. 327.

Tuberculosis in Childhood.—Webster presents the results of an investigation of eighty-one children with varied manifestations of tuberculosis, and five adults with bone and joint tuberculosis. Bone and joint tuberculosis, bronchial lymph node and lung tuberculosis, and tuberculosis of the brain and meninges were found to be due invariably to the human type of Bacillus tuberculosis. Tuberculosis of the cervical lymph nodes and tonsils was shown to be of bovine origin to a predominating extent, the number of bovine infections in a series of twenty-four cervical lymph nodes being seventeen (70.8 per cent). A small number of mesenteric lymph nodes examined all yielded the bovine type of Bacillus tuberculosis. In no case was the bovine bacillus encountered outside the tonsils or the cervical or mesenteric lymph nodes. A discussion is included on the not infrequent failure of the guinea-pig inoculation test for the recovery of Bacillus tuberculosis.

South African M. Assn. Journal, Cape Town

6: 141-176 (March 12) 1932

"Avertin" Anesthesia. B. Weinbren.—p. 143.
Dental Problem: Prevention of Dental Disease. J. C. M. Shaw.—p. 147.

Journal of Oriental Medicine, South Manchuria

16: 33-39 (March) 1932

Effect of Alcohol on Labyrinth Reflex. M. Shinomiya, H. Nagami and H. Tsukamoto.—p. 33.
Difference in Normal Constituents of Urine in Japanese and Chinese Convicts. T. Shidoh, A. Abiko, M. Kobayashi and M. Watanabe. —p. 34.
Malaria in Manchuria. K. Hiyeda.—p. 36.
Amebic Dysentery in Manchuria. K. Hiyeda.—p. 37.
Development of Tarsal Bone-Nuclei in Chinese Children. T. Kitahara. —p. 38.
Unusual Unilateral Absence of Oviduct. K. Saito.—p. 39.

Bulletin Médical, Paris

46: 163-182 (March 5) 1932

*Gaseous Abdominal Abscesses. P. Mocquot.—p. 167.

Gaseous Abdominal Abscesses.—Mocquot reports six cases of gaseous abdominal abscesses to show the clinical aspects and the diagnostic difficulties they may present. Two of the cases concern abscesses of the upper part of the abdomen, especially the subhepatic region; three, of appendicular origin, were located in the right iliac fossa and the umbilical region; the sixth was in the pelvis, ascending into the hypogastric region and the left iliac fossa. What makes diagnosis difficult in cases of this kind is that, with a clinical history and general symptoms pointing to an inflammatory process, one can find none of the physical signs of a localized abdominal abscess; there is no doughiness, and the hardness so characteristic of suppuration, as well as dulness on percussion, is wholly lacking. The abdomen is sometimes considerably distended; the meteorism is so pronounced it may cause compression of the chest and dyspnea and one finds a tympanitic resonance everywhere, which one is tempted to attribute to distention of the intestinal loops. Sometimes a pyogaseous collection, if contained in a well circumscribed cavity, possesses a definite perceptible contour, which would make one think of intestinal occlusion if the general symptoms did not contradict that diagnosis. While the customary signs of localization of an intra-abdominal suppuration (indicated by the general symptoms) are missing, there are a few symptoms to put one on the right track. The tympanites is not always uniform, the bulging is often more perceptible at the site of the abscess, there is sometimes a more pronounced tension of the wall in that region, and the resonance is more tympanitic than in the rest of the abdomen. The author thinks palpation of the anterior wall of the abdomen is deceiving and stresses the importance of bimanual palpation to acquire a precise idea of an abnormal tension, an increase in thickness, and a fulness, which is the sign of a gaseous collection. Above all, it is necessary to have the gaseous abscess in mind to arrive at a correct interpretation of seemingly contradictory symptoms. The value of hematologic and especially roentgenologic examinations is mentioned. The author also discusses the source of the gas filling the cavity of the abscess.

Gazette des Hôpitaux, Paris

105: 334-348 (March 5) 1932

Hypophyseal Syndromes. C. Dejean.—p. 337.
*Spontaneous Pleural Epilepsy: Case. R. Mignot and L. Couderc.—p. 343.

Spontaneous Pleural Epilepsy.—Mignot and Couderc state that epileptic crises of pleural and so-called spontaneous origin (independent of any intervention in the pleura) are rare, and they report the case of a woman who died following an epileptiform crisis occurring in the course of a serofibrinous pleurisy, which was apyretic and not recognized; no medical intervention on the pleura determined the convulsive phenomena. A woman, aged 49, was interned in an asylum because she suffered from hallucinations. No organic disturbances were noted, with the exception, perhaps, of a small quantity of pus in the urine. A condition of stupor soon developed, confining the patient to bed. During occasional lucid intervals, she complained of terrifying hallucinations. Death resulted from an epileptiform crisis about fifteen months after entry into the asylum. A week before death, zoopsic hallucinations and increased agitation were observed; no symptoms of organic disturbance were noted, and the patient did not cough or express any complaint and did not have a fever. Stertorous respiration was noticed the night preceding the crisis and again during the fatal crisis. The aspect of the brain and meninges at necropsy was normal, and there were no pathologic changes in the abdominal viscera, but opening of the thorax revealed a large serous effusion in the left plueral cavity; the lung was reduced to an atelectatic stump, firmly fixed to the wall by adhesions.

Paris Médical

1: 313-324 (April 9) 1932

Maxillary Sinusitis of Dental Origin. C. Ruppe.—p. 313.
Return Circulation and Gestation. C. Laubry, E. Lévy-Solal and A. Tzanck.—p. 321.
*Interesting Form of Breast Cancer: Degenerated Adenoma. A. Schwartz.—p. 323.

Form of Breast Cancer: Degenerated Adenoma.—Schwartz reports the case of a woman who came to him with a tumor of the breast, the symptoms of which resembled those of a fibro-adenoma but were not quite as marked as those of a true fibro-adenoma. The tumor mass, which was the size of a small orange, was movable, but the mobility was not as extensive as in a normal fibro-adenoma; also the movement of the skin over the tumor was not absolutely free, a beginning adherence being found. These two characteristics determined the diagnosis of degenerated fibro-adenoma, which was confirmed by intervention. The case report is followed by a discussion of the clinical aspects which a fibro-adenoma may present. In certain cases the degenerated fibro-adenoma, while assuming entirely the appearance of a cancer, keeps for a long time its definitely circumscribed character, which permits it to be differentiated from pure cancer although leaving no doubt as to its neoplastic nature. In other cases, the degeneration exists but nothing permits one to suspect it. The author here warns against assuring a patient with certainty that a tumor is benign. When a fibro-adenoma is removed, the clinician should tell the patient that a histologic examination will be made to confirm the absence of suggestive cells; if the examination reveals neoplastic degeneration and amputation of the breast is necessary, the patient, already forewarned, may be told that a few suggestive cells were found and while the tumor is, on the whole, benign, a more extensive operation will be necessary. Between the two types of clinical aspects described stands the case in which a doubt exists. In these cases the tumor should be removed under local anesthesia and an immediate histologic examination undertaken. The author considers it bad to remove

such a tumor and a few days later amputate the breast, as it may lead to an early and rapid generalization of the neoplasm. He advises above all to try to make a clinical diagnosis of the malignant change so that one can perform the necessary operation immediately.

Revue Française de Gynécologie et d'Obst., Paris

27: 157-204 (April) 1932

Technics of Abdominal Cervical Cesarean Section. J. L. Wodon.—p. 163.
New Method for Diagnosis of Lesions of Mammary Gland: Transillumination, or Diascopy. P. Ulrich.—p. 182.
*External Strangulation of Uterus. S. W. Kissine.—p. 194.

External Strangulation of Uterus.—Kissine reports an unusual case of external strangulation of the uterus associated with its prolapse and discusses the literature. The patient was a woman, aged 70, who had been suffering from occasional prolapse of the uterus for eleven years. Reduction of the uterus had always been accomplished by the patient, in horizontal position, without difficulty. On the occasion when the author was called, the uterus had again prolapsed but could not be reduced by the patient. It protruded from the genital opening like a tumor one and a half times the size of a fist. The external orifice of the cervix inclined toward the perineum. The prolapsed tissue, which seemed wedged in place, was reduced by the author only after repeated attempts and the application of a certain amount of physical force. Bimanual examination immediately after the reduction revealed a firm, slightly enlarged uterus with an elongated cervix and to the left of it a round, hard, mobile tumor the size of an apple, apparently associated with the ovary. The author considers it unlikely that the resistance of the uterus to reduction was due to edema, as it had been reduced easily a short time previously, or to inversion, because of the external aspect and the presence of the cervical orifice, but attributes it to the tumor. He thinks it probable that the tumor usually remained in the abdominal cavity but in this instance was forced out by considerable intra-abdominal pressure or pulled out by the uteroovarian ligament during the descent of the uterus, so that the ovarian tumor was in front of the pubic arch, and the uterus, in anteflexion, was in front of the tumor. The two organs could not be returned to the interior together, and it was necessary to return the ovary before the uterus could be reduced.

Archivos Argentinos de Pediatría, Buenos Aires

3: 131-208 (March) 1932

Splenectomy in Some Hematosplenic Syndromes in Children. M. Acuña.—p. 131.
Encysted Streptococcal Peritonitis Complicating Scarlatinal Nephrosis and Acute Anemia in Child. E. A. Beretervide and S. Mindlin.—p. 150.
Apnea in Infancy. J. M. Macera.—p. 160.
*Vertebral and Costal Osteomyelitis in Early Infancy. M. Gamboa and H. L. Montarcé—p. 178.
Congenital Xanthelomatous Angiolymphangioma of Gingival Margin. J. M. Jorge, S. I. Nudelman and M. Gringauz.—p. 190.

Vertebral and Costal Osteomyelitis in Early Infancy.—Gamboa and Montarcé state that the localization of osteomyelitis in the vertebrae is rare and indicates a grave form of the disease. The lumbar vertebrae are the most frequently involved, but there is a possibility of development of the disease in any other vertebra. The seriousness of the disease bears a relation to the seat of localization of the osteomyelitic lesion, either in the bodies of the vertebrae or in the vertebral arches (more grave when involving the bodies of the vertebrae than when involving the vertebral arches), and not with its segmental localization (in the cervical, thoracic or lumbar segments of the vertebral column). The involved vertebrae, surrounded by blood and pus, undergoes a process of destruction caused by the infiltration of the spongy tissue with pus. The symptoms are in relation to the intensity of the pyemic infection, the irritation of the spinal nerves, the spinal cord involvement and the general condition of the patient. In rare cases the osteomyelitic abscess, instead of following an evolution of exteriorization, progresses toward the spinal canal, thus giving origin to the appearance of symptoms of medullary compression, such as paraplegia, hemiplegia or relaxation of the sphincters. In this case the abscess may rupture into the spinal canal. The meningeal reaction in this type of osteomyelitis is grave, and usually death occurs. In subacute forms the pyemic infection is attenuated, the meningeal reactions are less severe, and if the patients are properly treated, about 54 per cent of recoveries is obtained. In acute cases the treatment is solely surgical. It is advisable to remove and drain the septic foci as soon as possible. In subacute cases the evacuation of the pus, by a puncture of the abscess, the administration of pyogenic vaccines, the immobilization of the spine in a cast, and the proper treatment to improve the patient's general condition, give good results. The authors report a case of vertebral and costal osteomyelitis in an infant, aged 40 days. The patient presented five days after birth a tumor on the right hip bone (probably a benign hematoma caused by either obstetric or postpartum trauma). Some days later he presented the symptoms of an acute infection and a gibbosity of the thoracic segment of the vertebral column which proved to be an osteomyelitic abscess involving the sixth, seventh and eighth thoracic vertebrae with extension of the lesion to the heads of the sixth, seventh and eighth ribs. The abscess was situated in the vertebrae and nevertheless the infection and the meningeal reactions (opisthotonos) were of a subacute type. The roentgen examination showed that a process of bone healing of the involved vertebrae and heads of the ribs was produced under the influence of the treatment. From the pus obtained by puncture of the abscess of the hip bone, in this case, streptococci were identified. The authors believe that, in their case, an umbilical infection may have been the portal of entry of the infection. The passage of pyogenic bacteria into the blood may have caused the infection of the tumor of the hip bone, followed by the development of the vertebral osteomyelitic lesion. The gibbosity disappeared and the patient recovered.

Beiträge zur klinischen Chirurgie, Berlin

155: 1-160 (March 16) 1932

Extension Bed for Traction Bandages. M. Kirschner.—p. 1.
Suprarenals as Measuring Apparatus for Qualities of Blood. R. Schweizer.—p. 17.
Experimental Investigations on Resorption Processes in Joints Under Various Physical Conditions. W. Müller and H. J. Lauber.—p. 39.
Anatomic-Roentgenologic Studies on Problem of Congenital Malformation of Foot. K. Horsch.—p. 51.
*Treatment of Malignant Tumors with Radium and Surgery: Results. A. Láng.—p. 67.
Lymphatic Vessels of Tubular Bones. H. U. Kallius.—p. 109.
Teratoid Tumor of Abdominal Cavity. F. Weier.—p. 125.
*Diagnosis and Treatment of Chronic Abscesses of Bones. H. Kment.—p. 129.
Intravenous Pyelography and Its Relation to Renal Function. H. J. Lauber.—p. 146.

Treatment of Malignant Tumors with Radium and Surgery.—Láng advocates the use of radium in such localizations and in those stages of cancers in which surgical interventions are impossible or will give less favorable results. He considers radium therapy especially helpful in cancers of the oral cavity. The results he obtained with radium in these cases are such that surgical interventions involving considerable mutilation are no longer justified. However, not only in cancers of the oral cavity but also in those of the nasal cavity, of the larynx and of the palate, that is, in regions in which surgical interventions are extremely dangerous and difficult, radium produces favorable results. For cancers of the face and the lips, radium is superior because of its more favorable cosmetic effects. The author emphasizes that he obtained his favorable results with comparatively small quantities of radium. He thinks that the experienced surgeon can use radium to greater advantage than the irradiation specialist, for the reason that in many cases the surgeon can place the substance more favorably.

Diagnosis and Treatment of Chronic Abscesses of Bones.—Kment points out that chronic abscess of the bone may be mistaken for such conditions as articular rheumatism, syphilis, gout or tumors, but he thinks that such erroneous diagnoses can be avoided if careful attention is given to the anamnesis. After mentioning the chief symptoms, he describes the characteristic roentgenogram. Especially in the metaphysis of the long bones, such as the tibia and the femur, the abscess cavity appears as a spherical or oval, sharply outlined area of decreased density with greater density of the surrounding bone tissues. On the basis of several case reports, the author then

shows that the term "chronic abscess of the bone" as denoting a separate disease entity is not justified but that this condition is a form of the hematogenic, chronic, suppurative osteomyelitis without abscess formation. In regard to the treatment, he states that he has abandoned the former practice of a wide opening of the cavity of the bone in such abscesses, for it involves certain difficulties on account of the nearness of the joint, in that usually there remains a funnel-shaped opening, which it is impossible to obliterate by muscle flaps, since there is generally little muscular tissue in the region of the abscess. For this reason the author has for years employed a half-fluid iodoform preparation as a filling for the abscess cavity. The filling is introduced after the abscess cavity has been evacuated and then dried by prolonged tamponade. It is essential that no air filled spaces remain but that the filling close the entire cavity. Following the filling the periosteum is carefully closed over the drill canal and the soft parts are sutured in layers. The wound heals by primary intention, but in some instances fistulas develop after the operation. These, however, usually do not originate in the bony cavity but rather are due to the particles of iodoform that during the introduction of the preparation entered the soft tissues. A later roentgenoscopy nearly always revealed that the cavity was completely filled.

Deutsche medizinische Wochenschrift, Leipzig

58: 437-474 (March 18) 1932

Goethe and Nature. A. Liebert.—p. 437.
Persons with Endocrine Deficiencies. J. Bauer.—p. 439.
*Form of Endocarditis Caused by Anaerobic Streptococci. K. Bingold. —p. 443.
Treatment of Cleft Lip and of Cleft Palate. M. Wassmund.—p. 445.
Experiences with Acetic Aldehyde as Circulatory Remedy. H. Burchard. —p. 448.
Chronic Benzine Poisoning. H. G. Schwarz.—p. 449.
*Significance of Lactic Acid Content of Vagina. I. Traube and L. J. Weber.—p. 450.

Endocarditis Caused by Anaerobic Streptococci.—Bingold points out that although the pathogenic character of anaerobic streptococci has been established, it was not known until recent years that they may cause endocarditis. Because of the peculiar pathogenesis of such cases and because of certain characteristic aspects, the author gives the detailed histories of two cases that he observed recently and short reviews of other cases that had been reported before. In the summary he mentions the following as the most characteristic aspects of endocarditis caused by anaerobic streptococci: 1. The disease always takes a fatal course. 2. The slight pathologic changes on the cardiac valves and on the other portions of the heart do not correspond to this unfavorable prognosis. The lesions do not have an ulcerous character. 3. Compared with endocarditis lenta, the course is more acute or subacute. 4. In contradistinction to the endocarditis caused by aerobic organisms (staphylococci and streptococci), in which, as a rule, there exists a continuous fever, the endocarditis caused by anaerobic streptococci is characterized by frequent attacks of chills. 5. In spite of frequently observed continuous bacteremia, there is an almost complete lack of metastases, in contrast to the septic endocarditis caused by streptococci and staphylococci. Emboli are found almost exclusively in the lungs. 6. Ports of entry of the anaerobic organism are primarily the female genitalia, the tonsils, the middle ear and the intestinal tract. 7. The occurrence of numerous anaerobic streptococci in the blood culture (outside of the attacks of chills) makes the diagnosis of anaerobic streptococcic endocarditis possible during life, even when heart murmurs are absent. The treatment may be the same as in other forms of septic endocarditis, but in all the cases that came under the author's observation it failed.

Significance of Lactic Acid Content of Vagina.—Traube and Weber call attention to the fact that the vaginal secretion has an acid reaction and that the acid content consists primarily of lactic acid. It has been determined that the acidity varies in different women and also that it varies in the same woman at different times of the menstrual cycle. It is highest during menstruation and lowest midway between two menstrual periods. It has also been found that spermatozoa are impaired by a high concentration of lactic acid. The latter factor makes it understandable why in sterile women, with a high acid content of the vagina, conception has been facilitated by vaginal douches with alkaline solutions. On the other hand, conception can be prevented by introduction of substances containing lactic acid or by irrigation with lactic acid or acetic acid solutions. The injurious effect of lactic acid on the spermatozoa is explained by colloidochemical processes. Acid solutions, especially lactic acid solutions, cause swelling of lyophil colloids, and since spermatozoa consist mainly of lyophil colloids, it is understandable that the swelling action of lactic acid impairs their functions.

58: 519-558 (April 1) 1932. Partial Index

*Postoperative Circulatory Therapy. G. von Bergmann.—p. 519.
Clinical Aspects of Sarcoma. F. König.—p. 523.
Rectal Strictures and Lymphogranuloma Inguinale. A. W. Fischer and Schmidt-La Baume.—p. 527.
Rectal Analgesia with Magnesium. P. Kotzoglu.—p. 535.
Simple Apparatus for Quantitative Determination of Sugar in Urine. E. Herzfeld.—p. 536.
Anesthesia: Experiences in America. H. Widenhorn.—p. 536.
Value of Cinematography in Psychiatric Neurologic Research. E. Herz. —p. 539.
Cinematography and Photography in Surgery. A. W. Fischer.—p. 540.

Postoperative Circulatory Therapy.—In discussing postoperative shock or collapse, von Bergmann does not refer only to the collapse that develops during the anesthesia or immediately after the intervention, but even more to those threatening conditions that develop on the following day or even several days later, and also to the usually less harmful conditions that develop after the patient first gets up again, such as attacks of fainting, cold extremities and general weakness. He shows that these conditions are not caused by a cardiac weakness but are primarily the result of a disturbance in the distribution of the blood. The decomposition of protein that takes place after surgical interventions, and the resulting autointoxication, influence the peripheral circulation in such a way that large quantities of blood are retained in the periphery, and the amount of blood received by the heart is not adequate. It should therefore be the object of the treatment to empty the peripheral blood depots. The so-called autotransfusion by bandaging the extremities is helpful to some extent. However, it should be considered that neither this transfusion nor transfusion from a donor can be of much help as long as a large portion of the vessels are pathologically dilated. It has been proved that camphor and camphor-like substances are helpful for this condition and that strychnine and injections of caffeine are the remedies of choice. The author thinks that in life-endangering conditions several of the remedies can be tried at intervals of from two to three hours. The use of digitalis he considers necessary only when the cardiac action fails, and the prophylactic application of digitalis preparatory to an operation he considers as entirely ineffective.

Deutsches Archiv für klinische Medizin, Berlin

172: 429-694 (March 21) 1932. Partial Index

*Calcium and Potassium Contents of Blood Serum and Ultrafiltrability of These Minerals in Renal Insufficiency. H. G. Scholtz.—p. 472.
*Value of Alimentary Galactosuria in Diagnosis of Diseases of Liver. W. Hochheim and B. Misske.—p. 511.
*Therapeutic Modification of Mineral Composition of Blood in Tetany. H. G. Scholtz.—p. 539.

Calcium and Potassium Contents of Blood Serum.—Scholtz made tests on the calcium and potassium contents of the serum of patients with renal insufficiency and also considered the ultrafiltrable portions. In some cases of contracted kidney and of acute nephritis, he detected low values of calcium in the serum. In the majority of cases of contracted kidney, the ultrafiltrable portion of calcium was reduced and the percental content of colloidal calcium was increased. This manifestation has no relation to the amount of the rest nitrogen and does not increase the predisposition to spasm, but it is assumed that it has some connection with changes in the protein bodies. An increased potassium content of the serum was found, especially in anuria. When the potassium content of the serum is increased, the potassium appears largely in the colloidal form. The ratio of calcium and potassium in renal insufficiency has no apparent relationship to the clinical manifestations.

Alimentary Galactosuria in Diseases of Liver.—Hochheim and Misske show that the clinical value of Bauer's

galactose test has not been definitely demonstrated as yet. They think that the galactose test can have value only if it can be done in a simple manner and if it helps in clearing the diagnosis in questionable cases. Blood sugar curves have only theoretical value. The authors performed the test on 225 patients, of whom 100 had hepatic or biliary disorders and the other 125 had various other disorders. It was found that in severe toxic icterus the test gives usually, but not always, a positive reaction. However, in mild cases of toxic icterus the test fails, which of course reduces its diagnostic value considerably. The test was plainly positive in a case of Addison's disease.

Therapeutic Modification of Mineral Composition of Blood in Tetany.—Scholtz describes changes that he observed in the calcium, potassium, sodium and phosphorus pentoxide contents of the serum, and changes in the physical conditions of these minerals during idiopathic tetany, while the patient underwent treatment with calcium, with parathyroidal preparations or with ammonium chloride. Administration of small quantities of calcium did not increase the calcium values of the serum, but the same doses of calcium caused a noticeable hypercalcemia in normal persons. By administration of large doses, the calcium content of the serum of the patient with tetany became nearly normal and there was also an increase in the ultrafiltrable calcium. However, the ratio of the colloidal to the truly solute portion of calcium remained, as before the treatment, in favor of the colloidal portion. Besides this there developed during medication with large quantities of calcium a considerable increase in the phosphate content of the serum, which otherwise was only slightly increased, and the increase was entirely in colloidal phosphorus. The parathyroid hormone modified the ultrafiltrable calcium and the clinical manifestations even before it increased the calcium content of the serum. When doses of calcium, which alone did not effect an increase in the calcium content of the serum, were administered simultaneously with the parathyroid hormone, there was an increase in the calcium content of the serum and the solubility conditions were normal. Accordingly it is assumed that the parathyroid hormone effects a mobilization of calcium in the tissues and that it perhaps also influences the solubility conditions of the calcium. Ammonium chloride, when administered alone, caused a considerable reduction in the calcium content of the serum but also increased its solubility. When administered together with calcium, the ammonium chloride produced apparently normal calcium conditions in the serum. A characteristic behavior of the potassium values of the serum was not noticeable. The sodium values were normal.

Klinische Wochenschrift, Berlin

11: 489-528 (March 19) 1932

*Changes in Function of Liver During Pregnancy. C. Kaufmann.—p. 493.
Latent Hepatopathy Following Pregnancy Toxicosis. F. Stroebe.—p. 495.
*Significance of Heavy Metals for Treatment of Anemia. K. W. Schultze.—p. 497.
Modification of Insulin by Red and Ultraviolet Irradiations. H. Küstner and W. Eissner.—p. 499.
Calcium Metabolism of Isolated Surviving Bone During Venous Blood Perfusion. W. Rieder and H. Never.—p. 501.
Predisposition for Thrombosis and Its Prophylaxis. G. Bankow.—p. 502.
Influence of Thyroxine or of Solution of Potassium Hydroxide, Respectively, on Tuberculin Skin Reaction. P. Kallós and W. Müller.—p. 504.
Leukocytosis and Fever in Carcinoma. A. Leszler.—p. 506.
Registration of Acidity Fluctuations in Stomach by Electrochemical Method Without Withdrawal. H. Taterka and L. Dinkin.—p. 508.
Little Regarded Inhibition Manifestation in Isohemagglutination. F. Schiff.—p. 509.
Power of Organism to Produce Changes in Bacteria. G. Bernhardt.—p. 510.
Influence of Preceding Nutrition or of Insulinization on Sugar Tolerance Test. R. Boller and K. Ueberrack.—p. 511.
Chemical Nature of Wassermann Antigens. O. Fischer.—p. 512.
Lymphogranuloma Inguinale Reaction. W. Frei.—p. 512.

Changes in Function of Liver During Pregnancy.—Kaufmann, in testing the various functions of the liver during normal pregnancy, found a high percentage of abnormalities. These changes are characterized by a deficiency in the carbohydrate assimilation of the liver, a deficiency in the elimination of administered bilirubin, and a reduced glycogen content of the liver. The author then discusses whether this abnormal reaction is a weakness or is a partial manifestation of the changes in the entire metabolism. He thinks that the changes in the metabolism overtax the function of the liver. As a result of this the liver does not have a sufficient reserve power to cope with tolerance tests. The abnormal course of the functional tests of the liver is thus a result of the metabolic changes that develop during pregnancy. But one should not designate this course of the reaction as "pathologic." However, that the great functional requirements of the liver may also produce a weakness was proved by postpuerperal after-examinations on two women. In both of them, functional tests of the liver revealed disturbances as late as six months after confinement, and neither of the women nursed her infant. Moreover, a careful anamnesis gave no indications that a disturbance of the liver had existed before the pregnancy. It is possible that these cases are exceptions, yet even in that case it can be concluded that a normal pregnancy may be the cause of a latent hepatopathy.

Significance of Heavy Metals for Treatment of Anemia.—Following a review of the literature, Schultze reports his own studies on rats. He emphasizes that in these studies two factors have to be kept apart: (1) the formation of hemoglobin, which according to the present status of knowledge is possible only if iron is present, but which is probably catalytically influenced by other metals, and (2) the formation of erythrocytes. It was his object to determine whether synthesis of hemoglobin and formation of erythrocytes are separate functions, and also whether the elements to which a catalytic effect is ascribed influence the hematopoietic system without the presence of iron. His tests were made with nickel, cobalt, copper and iron. He found that whereas iron influences both the hemoglobin synthesis and the formation of erythrocytes, the other elements—cobalt, nickel and copper—stimulate the erythropoiesis without being able to influence the hemoglobin synthesis in the absence of iron. The catalytic effect of the various metals is due to the fact that they exert a formative stimulation on the red bone marrow. The effect of liver therapy in the treatment of anemia is probably largely due to the action of copper.

11: 529-576 (March 26) 1932. Partial Index

Surgical Significance of Liver and Its Functional Disturbances. E. Rehn and H. Eitel.—p. 529.
Juvenile Gangrene. K. Neubürger.—p. 533.
Postappendicitic Mesenteric Pyemia: Its Treatment. O. Kleinschmidt.—p. 535.
Indications for and Results of Early Splenectomy. R. Nissen and V. Schilling.—p. 537.
New Opinions on Thrombosis and Embolism. H. Lampert.—p. 539.
Aspects of "Pseudocholelithiasis" and "Accidental" Pains in Abdomen. R. Schmidt.—p. 545.
*Treatment of Posttonsillitic Pyemia by Ligation of Jugular Vein. E. Melchior.—p. 548.
Tests on Resorption of Tetiothalein Sodium. H. Eitel.—p. 551.
Technic of Suture of Vessels. F. Meythaler and T. Naegeli.—p. 552.
Demonstrability of Spleen in Roentgenogram as Test Method of Function of Spleen. W. König and F. Weber.—p. 552.
Galactose as Substitute Carbohydrate. H. Kosterlitz and H. W. Wedler.—p. 553.
Determination of Amount of Filtration by Glomeruli in Renal Diseases. A. Bergwall.—p. 554.
Treatment of Intestinal Invagination in Adults and in Nurslings. H. Meltzer.—p. 554.

Treatment of Posttonsillitic Pyemia.—Melchior thinks that the pyemic form of tonsillitis and the possibility of influencing it by ligation of the jugular vein is not sufficiently known by the general practitioner, who usually is consulted for such cases. The author admits that there are some forms that begin with chills and yet take a favorable course, but he advises that if the chills recur, and the temperature is unusually high so that the local processes do not provide a sufficient explanation, and if primary diseases of the blood such as agranulocytosis and leukemia can be excluded, ligation of the jugular vein should be resorted to, before it is too late. Two cases proved to him the significance of this procedure. In one patient the condition had progressed too far for treatment, but in the other the ligation led to recovery. The author emphasizes that the ligation does not have to be postponed until the vein has become involved; that is, after thrombosis has set in. He does not agree with those throat specialists who advise removal of the involved tonsil at this time. He considers tonsillectomy in the still infected region neither necessary nor helpful, and in some cases dangerous.

Medizinische Klinik, Berlin

28: 463-500 (April 1) 1932

Pathogenesis and Forms of Jaundice. T. Brugsch.—p. 463.
*Changes in Conception of Nature of Vitamins. E. Abderhalden.—p. 466.
Significance of Terms Inorganic, Organic and Organized, for Pharmacology. E. Starkenstein.—p. 466.
*Regulation of Insulin Production. E. Grafe.—p. 468.
Brucella Abortus Infections with Fatal Outcome. H. Curschmann.—p. 471.
Diverticulosis of Colon and Carcinoma of Sigmoid. H. Strauss.—p. 473.
Tumors Compressing Spinal Cord. M. Nonne.—p. 475.
Warning Against Thymol and Substances Containing Thymol, Mouthwashes and Tooth Pastes in Patients with Goiter. E. Edens.—p. 477.
Treatment of Phosphaturia and Formation of Phosphate Concrements of Urinary Passages in Alkali Therapy of Gastric and Duodenal Ulcers. O. Porges and E. Deutsch-Essenyi.—p. 479.
Cure of Rabbit Syphilis During Late Stage. W. Kolle and R. Prigge.—p. 482.
Immunity Conditions Toward Toxins of Streptococci and of Staphylococci in Septic Infections. O. Erlsbacher and P. Saxl.—p. 483.
Treatment of Vascular Spasms. G. Roesler.—p. 484.
Treatment of Hypothyroidism in Nurslings by Means of Thyroxine. K. Kern.—p. 485.
Fatal Cerebral Apoplexy Cause or Result of Fall? W. Brandis.—p. 485.

Changes in Conception of Nature of Vitamins.—Abderhalden states that formerly vitamins were considered as preformed substances that were contained in certain foods. In recent times, observations have been reported which make it appear probable that the substances contained in the foods do not represent the products that exert the vitamin action but rather develop from them, following resorption in certain tissues. If this assumption is true, the effective substances that develop from the "provitamins" could be compared with the hormones. The author's object in calling attention to this was to encourage investigations as to whether vitamins are formed in the organisms out of subtances contained in certain foods. If it should be shown that the real vitamins are formed beyond the intestinal wall, research would have new problems to solve, such as what types of cells are necessary for the different vitamins. The author is convinced that such studies would solve many problems in the action of vitamins, which as yet are not understood.

Regulation of Insulin Production.—Grafe shows that the regulatory system of insulin production is much more complicated than it appears at first. According to the law of the double or threefold security, which obtains in nearly all important metabolic processes, there are at least three interacting mechanisms. The superior and the one with the most delicate function is the central nervous system. There is probably a center in the thalamus, which responds directly to the fluctuations in the blood sugar, and which according to need sends its impulses by way of the vagus directly to the islands of Langerhans. In addition to this the sugar, like a hormone, also acts directly on the production centers of insulin. Fluctuations in the activity of the suprarenals likewise act directly on the insulin production. Whether the external secretion of the pancreas also exerts a regulatory influence on the insulin production has not been definitely established as yet, and it is considered improbable.

Monatsschrift für Kinderheilkunde, Berlin

53: 177-260 (March 17) 1932

*Influence of Rickets on Development of Jaws and Teeth. J. Kirsch and S. Rosenbaum.—p. 177.
*Acid-Base Economy in Children. A. Hottinger and G. Hottinger.—p. 204.
Local Blood Picture During Tuberculosis in Children. Gertrud Kehling.—p. 239.
Pathogenesis of Functional Albuminuria. H. Lewitus and W. Rabinowitsch.—p. 250.

Influence of Rickets on Development of Jaws and Teeth.—Kirsch and Rosenbaum examined twenty children during the nursling period and also during the period following for the presence of rachitic symptoms but never detected such symptoms, and during the period of dentition the children were also examined by dentists. Control examinations were made on children who had passed through severe rickets and also on a small group, who presumably had had a mild form of rickets. On the basis of these studies the authors reach the following conclusions: 1. Deformities of the jaws are found almost exclusively in children that have passed through a severe or a mild form of rickets. 2. Caries of the deciduous teeth is found frequently in children who are entirely free from rickets; however, in children who have passed through severe rickets the carious destruction of the deciduous teeth is still more pronounced. 3. Caries of the teeth of the second dentition is comparatively rare in children who have been free from rickets, but in those who had had rickets it was noted in 50 per cent of the cases. 4. Delayed dentition (appearance of the first deciduous tooth later than the eighth month) is also found in children without rickets.

Acid-Base Economy in Children.—In rachitic nurslings and in rachitic premature infants, the Hottingers observed a considerable increase in the elimination of organic acids, which reached normal levels again on recovery. Ammonia and the amino-acids showed a similar behavior. In the earliest stage of rickets there is no increase in the elimination of the organic acids, and for this reason the manifestation is of no value for the early diagnosis of rickets. If in the course of rickets a tetany develops, the erstwhile increased elimination decreases to normal levels or at least shows a slight reduction. Test on a healthy gravida during the seventh month of pregnancy revealed that the elimination of organic acids was normal. The new-born, who had icterus, showed a low elimination during the period of loss of weight. During dyspepsias that do not cause great changes in the metabolism there is a decreased elimination of organic acids, whereas during dyspepsias with atrophy there is an increased elimination. Likewise caused by secondary atrophy are the high values of organic acids in cases of pylorospasm, for in the early stages of this condition the elimination of organic acids is not increased. In exudative diathesis, the organic acid content of the urine fluctuates considerably. A child with diabetes eliminated enormous quantities of organic acids not only as long as acetone bodies were demonstrable in the urine but also after diacetic acid, acetone and sugar had disappeared from the urine. The authors also studied the influence of exogenic factors on the elimination of organic acids, such as irradiation with the quartz lamp, restriction of water intake, feeding with cow's milk instead of breast milk, and increased intake of proteins, fats or carbohydrates.

Wiener klinische Wochenschrift, Vienna

45: 417-448 (April 1) 1932

History of Anatomic Illustrations. A. Kronfeld.—p. 422.
Experimental Modification of Cerebellar Function by Irradiation with Short Waves. H. Hoff and E. Weissenberg.—p. 425.
*Influence of Diuretics on Impaired Heart. F. Donath.—p. 427.
*Demonstration of Tubercle Bacilli in Blood Stream (Löwenstein Method) in Skin Diseases. J. Konrad.—p. 430.
Panmyelophthisis Refractory to Therapeutic Measures. F. Lasch.—p. 434.
Treatment in Cases of Poisoning. J. Pal.—p. 435.
Medicinal Treatment of Incretory Diseases. A. Fröhlich.—p. 436.
Differential Diagnostic Significance of Pyuria. V. Blum.—p. 437.
Aspects of Arsenic Dermatoses. G. Nobl.—p. 438.

Influence of Diuretics on Impaired Heart.—Donath states that although the use of diuretics is of great value in the therapy of cardiac disorders, especially in conditions of decompensation, there are also cases in which potent diuretics cause undesirable complications. The author illustrates this by several case histories. On the basis of his observations, he advises one to strengthen the heart by medication with digitalis previous to employing a potent diuretic, or to combine the administration of the diuretic with strophanthin. During the time the diuretic is active, all bodily and psychic exertion should be avoided by the patient. If possible, the patient should be kept in bed for twenty-four hours. When not absolutely necessary, the use of potent diuretics should be avoided and those acting more slowly should be used. The author further suggests that in some cases the heart can be excluded from the diuretic work by resorting to surgical procedures, such as puncture in hydrothorax and in ascites.

Demonstration of Tubercle Bacilli in Blood Stream in Skin Diseases.—Konrad relates the results that have been obtained with Löwenstein's culture method in a dermatologic clinic in Vienna. His report covers a period of approximately two years. Löwenstein's culture method was employed mainly on blood specimens from patients with true tuberculosis of the skin, with tuberculids and with lupus erythematosus, but also in patients with so-called rheumatic dermatoses such as erythema exudativum multiforme, erythema nodosum and pur-

pura rheumatica, and finally in a group of persons that served as controls. Tests on fifty-two persons gave positive results in twenty-two instances. In tuberculous diseases of the skin, the blood culture was found positive in 50 per cent of the cases. The percentage of positive reactions was especially high in lupus erythematosus. That the tests are more often positive during spring and summer than during fall and winter was noticeable during 1930 and 1931; but this was not so noticeable during 1931 and 1932. The positive outcome of the culture test in one case each of lymphatic leukemia and mycosis fungoides indicates the necessity of further investigation.

Zentralblatt für Chirurgie, Leipzig

59: 769-832 (March 26) 1932

*Subcutaneous Rupture of Pectoralis Major, a Little Known but Typical Injury. E. Borchers and P. Tontscheff.—p. 770.
Problems in Treatment of Fractures: Early, Functional Treatment with Pendulum Splints. M. Tiegel.—p. 774.
Avulsion Fracture of Spina Iliaca Anterior Inferior. L. Rothbart.—p. 781.
Ileus Caused by Ascarids. N. Onaca.—p. 783.
Treatment of Tetanus with Procaine Hydrochloride. F. Mandl.—p. 785.
Myxoma of Neck with Paralysis of Recurrent Nerve. M. Shimizu.—p. 786.
Peptic Ulcer of Jejunum. A. Fischer.—p. 790.
Improvement of Ether Anesthesia by Higher Evaporation Temperature. M. Tiegel.—p. 797.

Subcutaneous Rupture of Pectoralis Major.—Borchers and Tontscheff relate the clinical history of a miner, aged 50, who, while lifting a heavy load, was accidentally pushed from the back so that the tensely contracted pectoralis major was forced against the edge of a cart. The man felt a severe pain on the left side of the chest, and on the following day marked swelling had developed, which was ascribed to a contusion of a rib. Several other physicians, who examined the patient, likewise failed to recognize the injury of the muscle, and when after eighteen months the man had not yet regained the full use of his arm, he came under the authors' observation. He complained of a weakness in the left arm and it was noticed that the left side of the chest was flatter. When the patient was told to try to adduct the arm while the examiner held it, it was noted that the lower two thirds of the muscle, namely, the pars abdominalis and the pars sternocostalis, appeared as if rolled together, and between this elevation and the upper arm there was a depression. This proved that the lower two thirds of the pectoralis had lost their connection with the tendinous attachment on the upper arm, whereas the upper third of the muscle, the pars clavicularis, had not been injured. Thus, if all three portions of the muscle are taken as a whole, there was a tear into the muscle. A careful review of the literature revealed that only ten similar cases have been reported, but it is noteworthy that a tearing of the muscle is more likely than a detachment of the tendon from the upper arm. In regard to the treatment, the authors state that in the reported case active treatment was not resorted to, but they think that in younger persons it might be attempted to reunite the muscle by a suture or even resort to plastic repair. In the conclusion, the main symptoms of the tearing of the pectoralis major are once more summarized.

Zentralblatt für Gynäkologie, Leipzig

56: 769-832 (March 26) 1932

Ovarian Tumor of Type Brenner and Its Position Among Tumors of Ovaries. R. Meyer.—p. 770.
Actinomycosis of Female Genitalia. Y. Ikeda and K. Ikeda.—p. 782.
*Roentgenologic Demonstration of Hydatidiform Mole by Means of Contrast Filling. E. Bortini.—p. 784.
*Roentgenologic Investigations on Pathology of Female Vertebral Column: Relation to Gynecologic Backache. H. Uebermuth.—p. 787.
Treatment of Ovarian Disturbances by Means of Urine from Gravidas. W. Schildberg.—p. 801.
Experiences with Aschheim-Zondek's Pregnancy Reaction: Its Forensic Significance. H. Hellendall.—p. 804.
Hematin Reaction in Extra-Uterine Pregnancy. S. Wolowa.—p. 812.
Experimental Biologic Interruption of Pregnancy. W. K. Tschaikowsky.—p. 815.

Roentgenologic Demonstration of Hydatidiform Mole.—According to Bortini, the early diagnosis of hydatidiform mole is often difficult since it has to be based on symptoms that are also found in other conditions. Absolutely certain is the diagnosis only after vesicles have been discharged. Following enumeration of the different symptoms on which the diagnosis is usually based, the author describes his method of roentgenologic demonstration. He points out that after three months a pregnancy can be recognized by means of roentgenography. If at this period repeated roentgenographies do not show portions of a fetus, it is permissible to resort to hysterography by introducing a contrast medium. The author employed an iodized oil and found the resulting roentgenologic picture so characteristic for a hydatidiform mole that it could not be mistaken for other conditions, such as cancer or myoma. The iodized oil enters between the vesicles of the mole and thus the roentgenogram has irregular outlines; it shows zones of various sizes and of various degrees of density and dark irregular stripes. In nine cases the author could confirm the diagnosis of hydatidiform mole with this method and in one instance he could base his diagnosis on this method of examination. He stresses that it is absolutely necessary to precede the injection of the contrast medium by a simple roentgenoscopy, so as to make sure that a normal pregnancy is not interfered with.

Investigation of Female Vertebral Column in Relation to Gynecologic Backache.—On the basis of former studies, Uebermuth reasons that gynecologic backache is sometimes the result of changes in the intervertebral disks. To find supporting evidence for this assumption, he made roentgenologic examinations of fifty women who complained of backache. He found that degenerative changes in the intervertebral disks can be recognized indirectly from certain conditions of the vertebrae. As indications he considers the following: a basin-shaped depression of the caudal and cranial vertebral surfaces, also sclerotization of these surfaces, and "transverse areas of hardening" underneath the terminal bony plate of the vertebral body (spongiosa plates). The latter manifestations indicate that the organism tends to replace the lost elasticity of the intervertebral disks by a greater solidity. The secondary manifestations in the bone develop quite early; namely, in the third decade of life. This corresponds to the early manifestations of wear and of age degeneration in the intervertebral disks. The circumscribed areas of increased density in the substantia spongiosa underneath the terminal bony plates may be interpreted as calcified cartilaginous nodules or as circumscribed spongiosa plates. These manifestations have clinical significance since they indicate degeneration of the intervertebral disks. During the progressive stage the changes cause disturbances in the static mechanical function of the vertebral column, which may result in backaches. The author considers overburdening of the female vertebral column during pregnancy as one of the main causes of the disturbances.

Polska Gazeta Lekarska, Lwów

11: 213-232 (March 20) 1932

Problem of Tuberculosis in 1882 and in 1932. S. Sterling.—p. 213.
Obligatory Medical Examination of Prospective Students of John Casimir University and Its Importance in Fighting Tuberculosis Among the Academic Youth. Z. Czeżowska, W. Grabowski and S. Hornung.—p. 218.
*Air Emboli During Insufflation in Artificial Pneumothorax. Z. Szczepański.—p. 223.
Clinical Onset of Chronic Pulmonary Tuberculosis in Adults. M. Ungar.—p. 225.

Air Emboli During Insufflation in Artificial Pneumothorax.—Of the four cases reported by Szczepański, severe symptoms of embolism occurred in three. In one case the result was fatal. In each of the three severe cases the author had to deal with a pneumothorax complicated by adhesions; embolism appeared during complemental insufflation, not during the original operation. Most probably, in the fatal case, death was caused by plugging of the coronary vessels, because cerebral symptoms were absent. The second case was the only one that occurred during the original insufflation. The symptoms were slight. In the third case, symptoms of embolism appeared after the operation was completed. In this and in the fourth case there were cerebral symptoms, characterized especially by onset of temporary blindness, without, however, any recognizable changes in the ocular fundus. According to the author's experience, the danger of embolism is imminent in cases with partial pneumothorax, complicated by adhesions. For this reason, he adds, it is best to avoid high pressures, which tend to rupture the adhesions and to open the vessels.

Przeglad Dermatologiczny, Warsaw

26: 207-354, 1931

Life and Work of the Late Professor F. Krzyształowicz. M. Grzybowski. —p. 207.
Structure of the Plate of a Nail. J. Alkiewicz.—p. 221.
Onychia Syphilitica Sicca. K. Sieńko.—p. 230.
*Ability of Blood to Neutralize Salicylic Acid in Allergic Skin Diseases and Other Dermatoses. W. Chylewski.—p. 236.
Women's Dermatoses with Hormonic Background. R. Leszczyński and S. Liebhart.—p. 243.
Serologic Reactions in Experimental Syphilis in Rabbits. T. Chorążak and K. Zisch.—p. 259.
Blood Coagulability in Syphilitic Persons with Reference to Amount of Calcium in Serum and Blood Types. M. Mienicki.—p. 274.
Presence of Neisser's Diplococci in Blood in Cases of Gonorrhea. S. Fedosewicz and E. Sawicki.—p. 305.
Urticaria Hereditaria (Familiaris) in Three Generations. K. Tropauer. —p. 317.
Case of Cysticercosis of Central Nervous System and Skin. B. Stepień and M. Grzybowski.—p. 321.

Salicylic Acid in Allergic Skin Diseases.—Among the allergic skin diseases there is a certain form of eruption, called by Rost "Spätexsudatives Ekzematoid." In this disease the ability of the blood to neutralize or bind salicylic acid is diminished and the patients are hypersensitive to salicylates. Chylewski completed a research in fifty-seven cases for the purpose of establishing in which of the allergic skin diseases minimal quantities of salicylic acid are neutralized, as compared with normal blood, and with other dermatoses. The author noted the quantities of free salicylic acid per milligram of ether extract of blood, in the following groups: (1) Rost's eczematoid; (2) urticaria; (3) strophulus; (4) tuberculosis of the skin; (5) secondary syphilis; (6) control, and (7-9) nonallergic: mycotic, staphylococcic and streptococcic. The results are: In urticaria perstans the blood binds or neutralizes minimal quantities of salicylic acid. In nonallergic dermatoses the ability of the blood to neutralize salicylic acid is not diminished but increased, which is, in the author's opinion, a new observation.

Klinicheskaya Meditsina, Moscow

9: 939-1040 (Nov.) 1931

Arterial Hypertonia and Arteriosclerosis. E. M. Kastanoyan.—p. 939.
Blood Pressure and Age. E. P. Orlova.—p. 945.
Spirometry in Study of Cardiac Function. V. M. Solomyaniy.—p. 948.
Comparison of Results in Measurement of Venous Pressure Using Volumetric Method and Blood Route Methods of Moritz and Tabora-Valdman. Ya. S. Leitman, S. A. Gilyarevskiy and A. L. Vilkoviskiy. p. 953.
Influence of Aeronautic Service on Cardiovascular System. V. G. Mirolubov.—p. 958.
Differential Diagnosis of Endocardial and Sclerotic Dystrophies of Bicuspid Valve. V. F. Kokh.—p. 971.
High Altitude of Arzny as Resort in Treatment of Cardiac Diseases. A. A. Lozinskiy.—p. 975.
Histologic Changes in Diaphragm as Related to Its Function. A. I. Strukov.—p. 982.
Pneumonoconiosis Among Porcelain Ware Workers and Its Connection with Tuberculosis. L. L. Golst.—p. 986.
*Immunity Against Bacteria of Gas Gangrene. I. Velikanov and F. Kavenoki.—p. 1003.
Experimental Cancer of Skin in Relation to Present Day Oncology. I. Ismail-Zade.—p. 1006.
Electrosurgery in Treatment of Cancer of Skin. A. M. Slutskiy and V. N. Preobrajenskiy.—p. 1011.
*Specificity and Practical Value of Davis Cancer Reaction. O. Gubanova. —p. 1017.

Immunity Against Bacteria of Gas Gangrene.—Velikanov and Kavenoki found that when they cultivated Clostridium oedematiens under strict anaerobic conditions the toxicity was increased so that 0.001 cc. was fatal for rabbits. When cultures were treated with a 0.5 per cent solution of formaldehyde and incubated at 37 C. for thirty days, the cultures became avirulent and harmless. Cultures so treated were used for immunization of animals. Rabbits were immunized with toxoid and mixtures of equal quantities of toxoid and vaccine; doses of 2, 3 and 5 cc. were injected intramuscularly at intervals of ten days; the animals were bled from fifteen to twenty-five days after the last injection, but titrations were not made until one or two months after bleeding. After immunization, rabbits tolerated easily 2, 5 and 10 lethal doses of culture. The serums examined two months after storage and diluted 1:5 neutralized two lethal doses of a three day culture of C. oedematiens. Horses were immunized with progressively increased doses, beginning with 25 cc. of a formaldehyde treated culture. The horses were bled eighty days after the first injection. The horse serum diluted 1:8,000 was found to neutralize 2 lethal doses of a three day culture of C. oedematiens. The serum stored for one year under different conditions still retained its protective power in a 1:1,000 dilution. The serum may prove beneficial in therapy.

Practical Value of Davis Cancer Reaction.—Gubanova states that her survey of the literature indicates a renewed interest in the Davis reaction as an adjuvant in the diagnosis of cancer. During her study, careful attention was paid to the technic. The test as first described by Davis required a slightly acid reaction of the urine (10 cc. of hydrochloric acid was added to 100 cc. of urine, the mixture was warmed to boiling, cooled, and 30 cc. of water-free ether added, the bottle was stoppered and placed in a cool dark place and the reaction was read in twenty-four hours). The author found that twenty-four hour or two to four hour old samples of urine gave negative Davis reactions even when acidified and with a specific gravity not less than 1.010, whereas freshly voided samples from the same patients gave strongly positive reactions even when the urine had a neutral reaction. Examinations for protein, sugar, acetone, urobilin, indican, blood, bile pigments, and the diazo reaction did not demonstrate any relationship to the Davis test. Boiling of the urine did not affect the results of the reaction. Care was taken to place the urine-ether suspension directly in a dark cool place, since light itself always gives a pink color to the ether. In reading the test, both the color of the ether phase and the sediment that came down after heating was noted. The reaction was considered negative when the ether phase after twenty-four hours was colorless and the precipitate was brown or dark brown; questionable, when the ether was orange and the precipitate brown; slightly positive, when the ether and the precipitate were rose colored; distinctly positive, when the ether was raspberry red and the precipitate raspberry colored; and strongly positive, when both the ether and the precipitate assumed a raspberry red. Among thirty-five patients with malignant neoplasms, thirty-two had positive Davis reactions without regard to the localization, while one with sarcoma and two with hypernephroma had negative reactions. The author also examined 160 patients without malignant tumors. The Davis test was found negative in one group of thirty patients with nonspecific and functional disturbances of the gastro-intestinal tract; negative in all but two (slightly positive in one instance of tuberculosis and another of lobar pneumonia) in a group of twenty-eight patients with diseases characterized by tissue breakdown and large quantities of protein breakdown products, as in tuberculosis, various abscesses, nephritis, gangrene; negative in two instances of cardiac decompensation; negative in twenty-eight cases of endocrine disturbance (the menstrual period did not influence the reaction); negative in eight instances of renal disturbance and also in another group of hepatic disturbance with large erythrocyte breakdown; in ulcer of the stomach and duodenum the reaction was negative; however, a group of twenty patients with circulatory disturbance, five with pernicious anemia and two with myeloid leukemia, had strongly positive Davis reactions; and among five patients with acute neurasthenia, three had distinctly positive Davis reactions. The reaction was negative in six instances of essential hypertonia and diabetes mellitus and in four instances of visceral syphilis, while two persons in a group of apparently healthy individuals gave positive reactions. It was noted that the reactions were similar in intensity and color of the ether phase and the precipitate in the cancer, pernicious anemia, myeloid leukemia, several instances of tapeworm infection, in women in the first month of pregnancy, and in the apparently healthy individuals.

9: 1041-1122 (Nov.) 1931

Clinical Aspect of Tonsillitis. D. D. Pletnev.—p. 1043.
Sympathetic Nervous System and Methods of Study. I. M. Gubergritz, A. C. Berlyand, Kh. P. Vainshtein, V. P. Vvedenskiy.—p. 1052.
*Lymphogranulomatosis: Disease of Paltauf-Sternberg. A. A. Oks.—p. 1060.
Fibrillary Arrhythmia in Cardiac Disease (Auricular Fibrillation). A. M. Sigal.—p. 1068.
*Two Aspects of Cardiac Decompensation in Relation to General Blood Circulation. M. Ya. Basok and T. L. Shesterikova.—p. 1076.
Influence of Carbonic Acid Baths on Muscular Work in Cardiac Disease. I. M. Sribner, R. N. Frenkel and M. H. Kritsman.—p. 1081.
Electrocardiograms in Study of Myocardial Function. M. S. Turkeltaub. —p. 1086.
Treatment of Bronchiectasis. A. A. Gerke.—p. 1089.

*Treatment of Cholecystitis and Angiocholitis with Duodenal Instillations. V. A. Triger.—p. 1092.
*Multiple Cystic Degeneration of Kidneys. S. L. Barkagan.—p. 1095.
Diagnosis and Therapy of Early Infiltration in Pulmonary Tuberculosis. S. N. Vainer.—p. 1099.
Tuberculosis Without Auscultatory Symptoms. M. P. Maksimchuk.—p. 1103.
Meaning of Demonstration of Bacillus Tuberculosis in Organism. F. L. Shpanier.—p. 1106.
Rheumatism and Tuberculosis. D. B. Marshalkovich.—p. 1109.
Treatment of Articular Rheumatism with Amidopyrine. G. L. Magazanik.—p. 1111.

Lymphogranulomatosis: Disease of Paltauf-Sternberg.—Oks states that the clinical course of lymphogranulomatosis is in favor of an infectious process. Statistics of this disease are few; the percentage is larger for men than for women; there are no age limits, although the majority of cases seem to occur in the age group 30 to 40. An accurate diagnosis of lymphogranulomatosis is possible only when the progress of the generalized process is typical and when the usual symptoms are present: enlargement of the lymph nodes and spleen, characteristic recurring elevation of temperature, and changes in the blood. Accurate diagnosis in localized lymphogranulomatosis is infrequent (thirteen cases were diagnosed accurately in a group of forty-seven); mistakes are generally due to the consideration of the disease as a systemic disease of the lymphatic apparatus only, and lack of recognition of the primary stages of the disease. It is now known that lymphogranulomatosis is a disease not only of the lymphatic apparatus but also of organs free from lymphoid tissue (nervous, bone). The large area of incidence leads to confusion with malignant neoplasms. The experimental, bacteriologic study of the blood is valuable in differential diagnosis. The diazo reaction usually appears in this disease. The author suggests the classification of glandular, mediastinal, splenomegalic, gastric, intestinal, pulmonary, dermal (mycosis fungoides), osteoperiosteal lymphogranulomatosis. Mistakes in diagnosis may be decreased if (1) in every case of glandular disease histologic and biopsy examinations are made, if (2) microscopic examinations are made in tumors and ulcers of the stomach and colon, and if (3) in cases of sepsis, typhoid, and miliary tuberculosis, experimental and bacteriologic examinations are made of the blood.

Two Aspects of Cardiac Decompensation in Relation to General Blood Circulation.—Basok and Shesterikova state that blood circulation in the organism is regulated not only by rhythmic action of the heart but by the whole vascular system. The exchange of fluids and electrolytes between the blood and the body tissues due to the blood circulation is influenced by blood pressure, rate of flow, and quantity of circulating blood. For the latter the authors used intravenous injections of colloid solutions of congo red and found that this method caused no accidents (seventy-five instances). Two kinds of decompensation were studied; namely, "plus decompensation," which indicated increased volumes of circulating blood, and "minus decompensation," which indicated small volumes of the circulating blood. The normal figures obtained from the study of individuals with healthy cardiovascular systems showed the circulating plasma to be from 35 to 45 cc. for each kilogram of body weight and the circulating blood to be from 65 to 83 cc. for each kilogram of body weight and the proportion of the entire body weight for plasma was from 3.5 to 4.5 per cent and for circulating blood from 6.5 to 8.3 per cent of the body weight. Pyknotic and hypersthenic individuals had smaller volumes of circulating blood (from 6.5 to 7.4 per cent of body weight) than asthenic individuals (from 8 to 8.3 per cent of body weight). The review of the clinical facts does not show what forms of decompensation are specific for increased or decreased circulating blood volume. Some workers have reported a decreased volume in patients with primary disturbance in the gaseous exchange in the lungs. From the point of view of treatment, patients with plus decompensation were treated with digitalis, the patients ordered to sit with the feet hanging down, and given a diet poor in nitrogen and salt; substances that increase blood circulation volume, such as camphor and caffeine, were also administered. Digitalis in cases of minus decompensation is indicated only according to the condition of the heart. The authors conclude that the whole volume of blood is present in the blood circulation of the body; and a part is present in the various organ depots. All things equal, each individual has a more or less constant volume of blood in his circulation. Patients with compensated conditions of the heart have a normal circulating blood volume; patients with decompensation have either a large circulating or small circulating blood volume: plus or minus decompensation.

Treatment of Cholecystitis and Angiocholitis with Duodenal Instillations.—Triger reports that, since 1924, 125 cases of diseases of the biliary tract have been studied in detail and treated by duodenal sound instillations. Treatment consisted of instillation of 40 cc. of from 30 to 33 per cent solutions of magnesium sulphate or, for stronger action, from 40 to 50 cc. of olive oil, every day for three or four days or, for torpid forms, from twelve to sixteen days. Occasionally hypophyseal extracts were also used in treatment. Hospitalization is necessary to insure results. In some instances, in addition to the intubation, the patients also received hot surface applications in the region of the liver, three glasses of mineral water a day, belladonna, papaverine and methenamine. The clinical picture after treatment was characterized (1) by an approach of the physical state of the bile to normal, decrease in leukocytes and a reappearance of the umbilical reflex; (2) by a gradual approach to normal and a reappearance of the umbilical reflex at the end of treatment (the majority were in this group); and (3) by an absence of change in duodenal contents, but improvement, with temperature back to normal, decrease in hepatic pain, decrease in the jaundice, and subjective improvement with disappearance of painful attacks. The treatment should be discontinued if no improvement is noted after two or three instillations. The treatment is indicated in all chronic forms of cholecystitis accompanied by spasms and in parasitic invasions as lambliasis (purely mechanical). Failures in 7 per cent consisted primarily of cases of acute cholangeitis, with large quantities of mucus and leukocytes in C bile, enlarged liver and subfebrile temperature (three of these were lamblia infestations). In some instances, improvement in the cholecystitis was accompanied by disappearance of the migraine and the tachycardia and systolic murmurs.

Multiple Cystic Degeneration of Kidneys.—Barkagan states that his detailed case history of multiple cystic degeneration of the kidneys is interesting because, aside from the typical symptoms with characteristic changes in the kidneys, nephritis and uremia, there are clinical manifestations, especially those that relate to the glands of internal secretion. Part of these disturbances were noted during life and part at necropsy. Deficiency on the part of the endocrine glands may be due to a sclerosing process or to defects in development. The author found neither in life nor at necropsy any signs of a chronic infectious process. The cystic process in the instance described spread to the liver and to the pancreas. This disturbance may be present for years without subjective or objective symptoms. The symptoms, when they appear, may be secondary, together with acute azotemia and loss of strength and ability to work; the disease is then in its final stages. An intervention is indicated only when the disease is unilateral with hematuria or a suppurative process in one kidney. Opotherapy should be a symptomatic indication.

Hospitalstidende, Copenhagen

75: 399-426 (March 3) 1932

Medical and Particularly Neuropsychiatric Indications for Induced Abortion. N. C. Borberg.—p. 399.
*Influence of Thyrotoxic Conditions on Arteries, Particularly in Exophthalmic Goiter. J. Ipsen.—p. 407.
Rare Case of Sarcoma of Uterus. H. Okkels and F. Therkelsen.—p. 415.

Influence of Thyrotoxic Conditions on Arteries.—Ipsen says that in exophthalmic goiter the foot temperature is higher than in normal cases; if the metabolism is over 130 per cent the foot temperature is above 35.5 C. (95.5 F.). Change in metabolism due to operation causes a fall in the foot temperature, even if the rectal temperature is unaffected. On operation of goiter patients under local anesthesia an acute rise in the foot temperature occurs, explained as a thyrotoxic effect on the arteries, possibly through the sympatheticus. In a case of myxedema, both the metabolism and the foot temperature rose on treatment with thyroidine. In a case of Raynaud's disease the arterial spasms could be checked or reduced parallel to the thyroidine treatment.

JOURNALS ABSTRACTED IN THE CURRENT MEDICAL LITERATURE DEPARTMENT, JANUARY-JUNE, 1932

Abstracts of important articles in the following journals have been made in the Current Literature Department of THE JOURNAL during the past six months. Any of the journals, except those starred, will be lent by THE JOURNAL to subscribers in continental United States and Canada and to Fellows of the American Medical Association for a period not exceeding three days. Two journals may be borrowed at a time. No journals are available prior to 1926. Requests for periodicals should be addressed to the Library of the American Medical Association and should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Thus most of these journals are accessible to the general practitioner.

Acción Médica. Buenos Aires.
Acta Chirurgica Scandinavica. Stockholm.
Acta Medica Scandinavica. Stockholm.
Acta Radiologica. Stockholm.
American Heart Journal. St. Louis.
American Journal of Anatomy. Philadelphia.
American Journal of Cancer. New York.
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*American Journal of Diseases of Children. A. M. A., Chicago.
American Journal of Hygiene. Baltimore.
American Journal of the Medical Sciences. Philadelphia.
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American Journal of Ophthalmology. St. Louis.
American Journal of Orthopsychiatry. Menasha, Wis.
American Journal of Pathology. Boston.
American Journal of Physical Therapy. Chicago.
American Journal of Physiology. Baltimore.
American Journal of Psychiatry. Baltimore.
American Journal of Public Health. New York.
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American Journal of Surgery. New York.
American Journal of Syphilis. St. Louis.
American Journal of Tropical Medicine. Baltimore.
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Annales de l'Institut Pasteur. Paris.
Annales des Maladies Vénériennes. Paris.
Annales de Médecine. Paris.
Annali dell'Istituto Maragliano. Genoa.
Annali Italiani di Chirurgia. Naples.
Annals of Internal Medicine. Ann Arbor, Mich.
Annals of Medical History. New York.
Annals of Otology, Rhinology and Laryngology. St. Louis.
Annals of Surgery. Philadelphia.
Archiv für Dermatologie und Syphilis. Berlin.
Archiv für Gynäkologie. Berlin.
Archiv für Hygiene und Bakteriologie. Munich.
Archiv für Kinderheilkunde. Stuttgart.
Archiv für klinische Chirurgie. Berlin.
Archiv für Psychiatrie und Nervenkrankheiten. Berlin.
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*Archives of Dermatology and Syphilology. A. M. A., Chicago.
Archives of Disease in Childhood. London.
*Archives of Internal Medicine. A. M. A., Chicago.
Archives des Maladies de l'Appareil Digestif, etc. Paris.
Archives des Maladies du Cœur, etc. Paris.
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Archives de Médecine des Enfants. Paris.
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*Archives of Neurology and Psychiatry. A. M. A., Chicago.
Archives d'Ophthalmologie. Paris.
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Beiträge zur Klinik der Tuberkulose. Berlin.
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Bollettino e Memoria della Società Piemontese di Chirurgia. Biella.
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Brain. London.
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Irish Journal of Medical Science. Dublin.
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*Cannot be lent.

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Zeitschrift für urologische Chirurgie. Berlin.
Zentralblatt für Chirurgie. Leipzig.
Zentralblatt für Gynäkologie. Leipzig.

SUBJECT INDEX

This is an index to all the reading matter in THE JOURNAL. In the Current Medical Literature Department only the articles which have been abstracted are indexed.

The letters used to explain in which department the matter indexed appears are as follows: "BI," Bureau of Investigation; "E," Editorial; "C," Correspondence; "ME," Medical Economics; "ab," abstract; the star (*) indicates an original article in THE JOURNAL.

This is a subject index and one should, therefore, look for the subject word, with the following exceptions: "Book Notices," "Deaths," "Medicolegal Abstracts" and "Societies" are indexed under these titles at the end of the letters "B," "D," "M," and "S." State board examinations are entered under the general heading State Board Reports, and not under the names of the individual states. Matter pertaining to the Association is indexed under "American Medical Association." The name of the author, in brackets, follows the subject entry.

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SOCIETIES

Acad.—Academy	*M.—Medical*
Am.—American	*Med.—Medicine*
A.—Association	*Nat.—National*
Coll.—College	*Phar.—Pharmaceutical*
Conf.—Conference	*Phys.—Physicians*
Cong.—Congress	*Rev.—Revision*
Conv.—Convention	*Ry.—Railway*
Dist.—District	*S.—Surgical*
Hosp.—Hospital	*Soc.—Society*
Internat.—International	*Surg.—Surgery, Surgeons*

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Sound teeth, in adults as well as children, depend upon utilization of necessary nutritional factors....

Prepare the protective foods for easy digestibility

IF IT WERE MORE GENERALLY KNOWN that accurate laboratory measurements of vitamin deficiencies in experimental animals are obtained from cross-sections of the teeth and bones, perhaps the newer scientific judgment that diet is a major factor in tooth maintenance would be more readily understood and applied in practical ways. It is quite clear that nutritional deficiencies of several types are very quickly reflected at all ages in tooth conditions, even though the exact causes and mechanics of destruction, aberrant growth, and repair are not clear.

To us the discoveries through new precision instruments and methods of some of the early evidences of malnutrition are especially significant in that they indicate the nutritional advantages *to adults* of eating the fibrous fruits and vegetables in the form of Van Camp's PUREED Foods. These are often regarded by physicians and laity alike as foodstuffs only for infants. Such preparation of foodstuffs for adults is avoided in American practice not alone from habit, but also from the notion that adult teeth are benefitted by the exercise of masticating coarse and fibrous foods.

There is no scientific evidence to support this notion about tooth exercise; and much information quite to the contrary is accumulating. That correct nutrition of teeth is necessary to their maintenance in adult life is the almost unanimous judgment of authorities. Though the nutritional requirements remain to be determined in detail it has been shown repeatedly that two or more vitamins and several mineral elements play important roles.

Fruits and vegetables are widely used in American life to enrich diets in vitamin and mineral values, yet it has been shown repeatedly in recent investigations that generally they are poorly utilized by human beings. Raw salads—so universally established in the American dietary—are criticised with increasing frequency by competent students because the evidence indicates doubt that they yield the nutritional results expected, probably due to poor utilization.

We have shown recently* that in experimental animals there is 83.5 greater hemoglobin regeneration from Van Camp's PUREED Spinach than when the same spinach is fed in the whole leaf form. High utilization of foods in human beings, through easy digestibility, has been demonstrated by many able investigators in quite a variety of considerations.

Van Camp's PUREED Fruits and Vegetables are reasonably indicated by all these facts to be quite superior preparations of these protective foodstuffs from the standpoint of human nutrition. Only the notion that adults should masticate such foodstuffs for the sake of tooth exercise supports the bad habit of eating such things raw or otherwise poorly prepared.

Indeed there are many indications in the current literature of nutrition that some of the nutritional deficiencies attributed by competent critics to the American dietary will be traced eventually to poor utilization or assimilation.

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*J.A.M.A. 97:23, page 51 (Dec. 5, 1931); 98:1, page 43 (Jan. 2, 1932); and 98:7, page 47 (Feb. 13, 1932).

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During the Depression

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